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ILLUMINATING ENGINEERING

Journal of the
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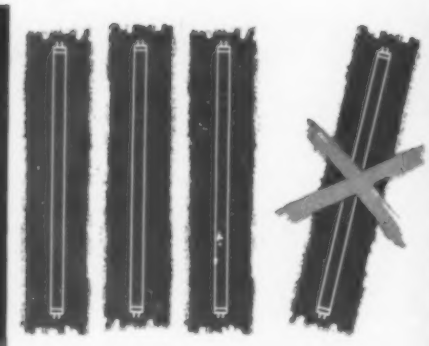
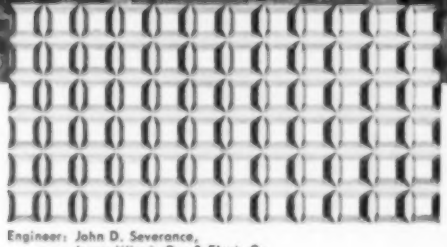


three lamps with Prismoid- do more work than four



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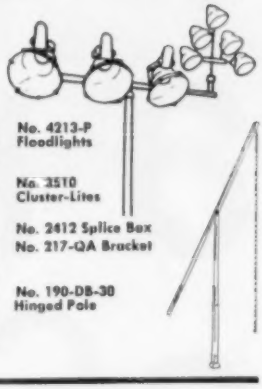

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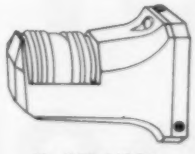
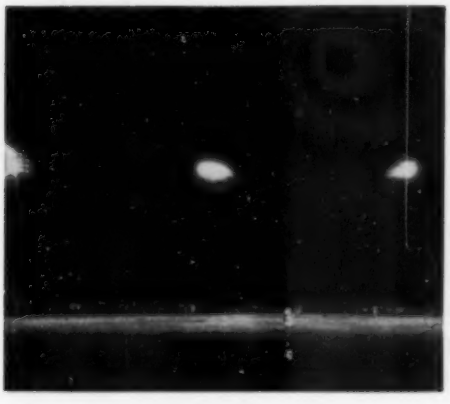


No. 3151-A Light

Lighting a Baseball Field



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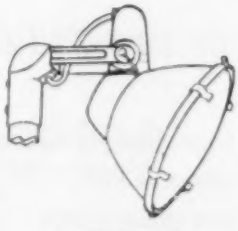

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THE JOURNAL OF THE ILLUMINATING ENGINEERING SOCIETY

July
1958

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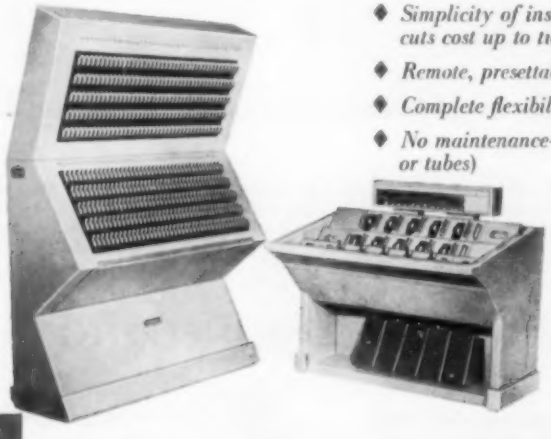

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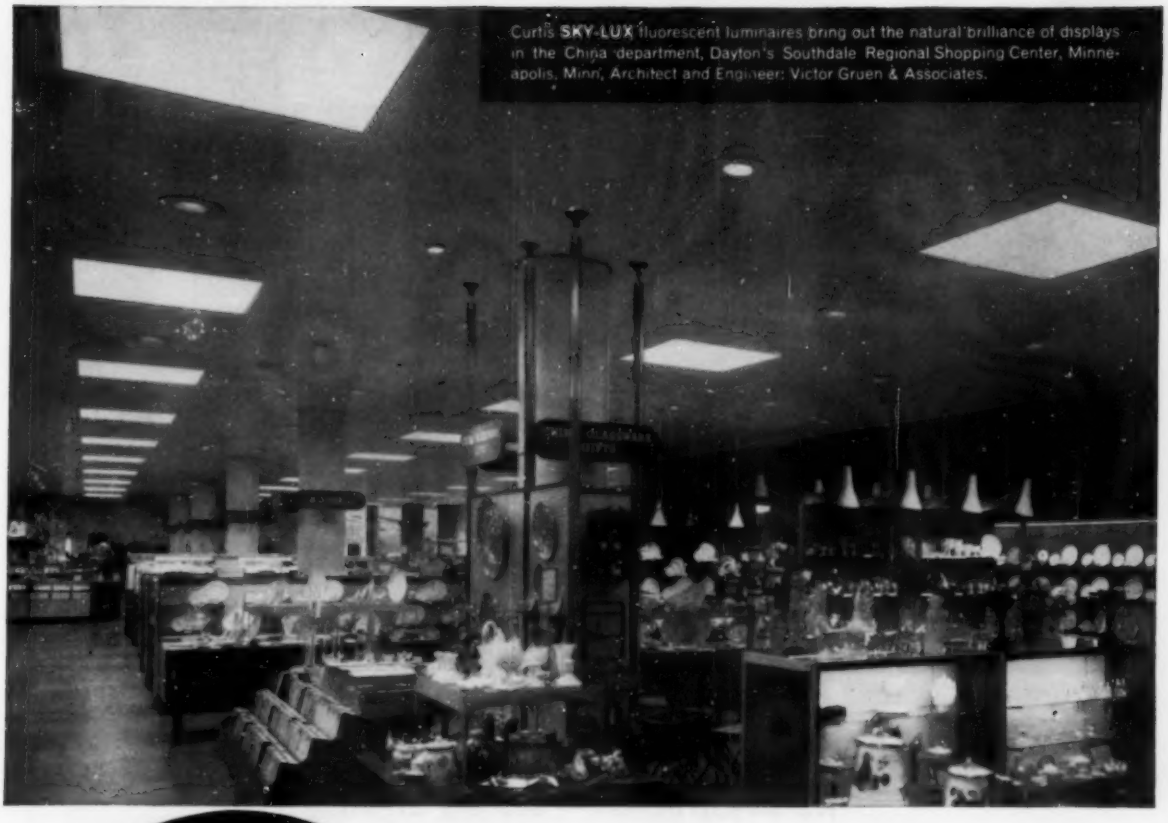

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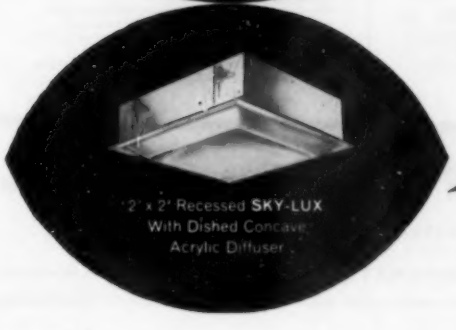

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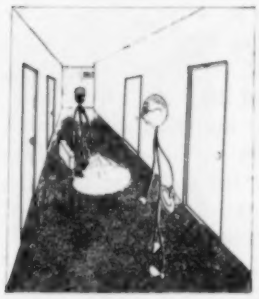
Lighting for Hotels

Prepared by the Subcommittee on Hotel Lighting of the Institutions Committee of the Illuminating Engineering Society



A theatrical effect may lead to lower electricity bills, but undoubtedly also to fewer guests.

Atmosphere is important in dining rooms, but don't force guests to supply their own illumination.

Many guests like to read in bed, but are discouraged from doing so when the light is clipped to a low headboard so that one must lie down to read . . .

. . . or is permanently fastened away from the bed.

FOREWORD

Hotels bring together under one roof many applications of special lighting problems covered in other lighting reports. The aim of this publication is to bring together in one place the needs and points of view of the hotel industry and the lighting industry. Some applications of illumination which may occur at a hotel (lighting for shops and gardens, for example) have been omitted. Rather, the emphasis is on lighting the areas which are usually found in all hotels — large or small; commercial or residential; downtown, suburban, highway or resort. The "back of the house" areas where employees work are covered as well as those which the guest uses.

This report is a joint effort of the Illuminating Engineering Society and the American Hotel Association. A committee of hotelmen, designers, engineers and lighting specialists worked several years to produce the following recommendations.

I.E.S. HOTEL LIGHTING COMMITTEE*

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Approved by the Council of the Illuminating Engineering Society, March 1958. A Transaction of the Society.

Too short desk lamps force one to bend way over. Lamps fastened to the right side of the desk force right-handed guests to write in their arm shadow.

A pair of dresser or dressing table lamps is necessary.

Washing is important.

Introduction

The hotel manager does not, of course, need to know lighting techniques in detail, but he should become reasonably conversant with the problems of illuminating his hotel: (1) to develop a critical attitude toward lighting from the point of view of being able to improve it, (2) to understand, within reason, lighting terms so that he may discuss illumination intelligently with authorities on the subject, and (3) to differentiate between the use of light sources for seeing and light sources for architectural effect. This material is presented to hotel operators to guide and stimulate their thinking in terms of lighting.

Light can be pleasing or displeasing. It can attract or repel. It may become a very significant factor in the enrichment of public rooms and bedrooms. It lends speed and precision to many operations. It provides safety against many accidents.

Chapter 1 — Lighting Terms

To discuss light it is necessary to use and understand at least two terms, the *lumen* and the *footcandle*.

(1) The quantity of light emitted by a source is measured in *lumens*.

(2) The quantity of light (lumens) falling on each square foot of observed surface is measured in *footcandles*.

Perhaps these terms can be better understood by visualizing a group of lights. When one light is on, a certain quantity of light, or lumens, is emitted. Assuming that 40 lumens of this light fall uniformly on a desk 10 square feet in area, the number of footcandles is then $40 \div 10 = 4$. If a second light in the same cluster is turned on, twice as much light is emitted, twice as much falls on the desk, and the footcandle measurement is $80 \div 10 = 8$.

Light sources are usually rated in watts. Each of the same type and wattage has a certain lumen rating. For example, a new 100-watt incandescent inside-frosted bulb, burned at labeled voltage, emits approximately 1630 lumens, while a 200-watt bulb emits 3700 lumens. It is interesting to note that the total lumens emitted by two 100-watt bulbs is less than that emitted by one 200-watt bulb.

Two other factors that are important to recognize are: (1) the footcandle level of illumination is related to the ability to see; and (2) the measured footcandles on a surface decrease as the distance from the surface to the light source increases.

Chapter 2 — Levels of Illumination

Footcandle levels of illumination are measured by a footcandle meter similar to the exposure meter used in photography. Such a measurement may be used as a check of an existing lighting installation. Several types of footcandle meters are illustrated in Fig. 2-1.

TABLE I — Current Recommended Footcandle Values.

	Footcandles
Auditoriums	
Assembly only	15
Exhibitions	30
Dancing	5
Bars and Cocktail Lounges*	
Bathrooms	
Mirror	30
General	10
Bedrooms	
Reading (books, magazines, newspapers)	30
Inkwriting**	30
Make-up†	30
General	10
Corridors and Stairs	20
Dining Areas	
Cashier	50
Intimate type —	
Light environment	10
Subdued environment	3
For cleaning	20
Leisure type	
Light environment	30
Subdued environment	15
Quick service type	
Bright surroundings‡	100
Normal surroundings‡	50
Entrance Foyer	30
Front Office	50
Kitchens	
Inspecting, checking, pricing	70
Other areas	30
Laundry	
Washing	30
Flat work ironing	50
Machine and press finishing	70
Linen Room — Sewing	100
Lobby	
General lighting	10
Reading and working areas	30
Machine Shop	
Rough Bench and machine work	50
Medium Bench and machine work	100
Fine Bench and machine work	500
Marquee	
Dark surroundings	30
Bright surroundings	50
Offices	
Accounting	150
General	100
Reception	30
Power Plants	
Boiler rooms	10
Equipment rooms	20
Store Interiors	
Circulation areas	30
General merchandise	100
Showcases	200
Feature displays	500
Stock rooms	30
Storerooms	10

*See Dining Areas — Intimate.
**Pencil handwriting, reading of reproductions and poor copies require 70 footcandles according to latest studies. Hotels catering to such business needs may wish to provide this illumination at the desk area.
†This may be done in the bathroom, but if a dressing table is provided, local lighting should provide the level recommended. See Section F, Lighting for Grooming at the Dresser or Dressing Table.
‡Including street and nearby establishments.

Figure 2-1. Portable footcandle meters:

(a) pocket-size meter,
(b) multicell meter,
(c) paddle-type meter,
(d) color- and cosine-corrected paddle,
(e) case-type hinged cell meter.

From wide experience over a long period of time, recommendations of footcandle values have been made for various rooms for particular purposes. Some of these recommendations are given in Table I. These values are adequate for the visual tasks involved in the specific areas and are in accord with the prevailing cost of lighting. Higher values than those given are desirable when they are found practicable and will usually result in more efficient visual performance.

The illumination levels designated in Table I can be provided practically with simple light sources. However, in many lighting situations many factors become more important than just directing the light to where it will be used. One such factor is the desired architectural effect or the aesthetic result. For example, indirect lighting, where the light source is hidden from view and the light is directed to the ceiling, is not the most efficient means of producing functional light, yet it is widely accepted from the aesthetic point of view. A two-fold problem may arise from this: one of economically producing the correct amount of light where it is to be used, and the other of locating and controlling this light so that its general effect is pleasing. The two sides of this problem should be weighed since undue emphasis given to either one can produce poor results.

There is sometimes a tendency to overdo the aesthetic at the cost of the practical. Perhaps the most glaring example of this is in the lighting of bedrooms, where many times too little light is provided in places where occupants choose to use it. At the same time, the most efficient system of lighting in a bedroom might possibly lose much of the atmosphere which the hotel guest desires. The ideal solution combines the art of decoration and the science of illumination.

The following general principles should be considered in designing any lighting plan for a hotel project:

(1) Proper levels of illumination,
(2) Elimination of glare,
(3) Eye comfort,
(4) Avoidance of large differences in brightness,
(5) Avoidance of monotony,
(6) Harmony with the decorative character of the area,
(7) First cost, operating cost and maintenance cost.

Figure A-1. Entrance foyer looking toward marquee outside. The white ceiling cove provides indirect lighting from eight 96-inch fluorescent lamps, two on each of the four sides. The marquee contains eleven 75-watt recessed spots spaced on 5-foot by 6-foot centers.

Chapter 3 — Lighting Specific Areas

This chapter includes specific lighting recommendations for the various hotel areas. For a summary of illumination levels see Table I, Chapter 2. Chapters 4 through 7 give general information on light sources, lighting installations, and maintenance, which is important to all who specify or operate hotel lighting systems.

A. Entrance Foyer

Entrance foyer lighting should create a cheerful and inviting atmosphere at first glance. The entrance foyer should have a high level of illumination in order to create a smooth and comfortable transition between the brightly lighted marquee or bright daylight and the lobby. Even though the lobby entrance incorporates specially illuminated architectural features, it should be more brightly lighted than the rest of the lobby; a level of 30 footcandles is recommended.

B. Lobby

Since the lobby is the first part of the hotel interior that the prospective guest sees, it should present a pleasing and hospitable atmosphere at all times. Good lighting plays an important role in achieving such an effect. To provide the needed quantity and quality of light in keeping with the architectural decor calls for careful study. Any successful solution combines in an harmonious manner the emotional, the functional and the architectural features of each problem, no two of which are ever alike.

The creation of a pleasant level of illumination, without undue brightness differences, is usually the best starting point for the general over-all effect. Lighting at a higher level is often desirable and effective in special locations within the lobby proper, such as the desk, the news-stand, small shops, shadow display boxes and small secluded areas to which the guest can retreat in peace.

The commercial hotel, where the pace is generally faster than that of the residential hotel, usually calls for a higher level of general illumination. In the residential or apartment hotel, a lower level of illumination is usually more appropriate, utilizing high level accents at certain points through the use of portable lamps, which may have to be specially designed if ceilings are higher than nine feet.

In a few hotels, the general illumination of the lobby has been successfully treated through the exclusive use of specially designed portable lamps directing the light to the ceiling, which in turn reflects the light back to the normal eye level. Ceilings must be white or very light in color in order to reflect most of the light.* This totally indirect solution has the advantage of eliminating large ceiling units as well as simplifying, to a large degree, the bulb replacement problem which may involve considerable expense. Table or floor lamps with a combined head for both shielded upward and downward components are necessary to provide local lighting for guests while reading.

Another type of totally indirect lighting is the pendant unit which hangs from the ceiling. This unit may have a large bowl into which a reflector is built to project the light upward to the ceiling.

Totally indirect lighting schemes can be planned to harmonize with the charm of the interior of the area. However, they must be carefully designed to avoid bright expanses of glaring white ceiling which might rob the objects in the room of their normal highlights and shadows. Flooding the entire ceiling area with light by a system of indirect lighting creates the illusion of a higher ceiling which is helpful in cases where the designer is faced with unpleasantly low ceiling heights.

*See Chapter 5, page 394.

Figure B-1. A small hotel lobby with cove lighting and simple attractive ceiling lighting units. Note also the tall table lamps for reading.

Figure B-2. Indirect lighting by means of silvered-bowl bulbs. The light-finished recesses redirect the light down.

Figure B-3. Lobby lighted by a large custom-designed luminaire. Table lamps provide reading light.

Figure B-4. Here fluorescent tubes are recessed above panels of "eggcrate" louvers.

Figure B-5. Downlights recessed in the ceiling provide most of the general lighting, but the two chandeliers with well-shielded bulbs add to the attractiveness of the interior. These and the table and floor lamps keep the ceiling from looking black, as it might with only the recessed units. The large-size table and floor lamps give a wide spread of light.

Figure B-6. Two-story lobby lighted by large luminous panels.

Figure B-7. Indirect lighting from bulbs in a suspended trough. Such a system requires a light-color ceiling.

An effect similar to indirect lighting can be obtained by using large plastic or glass panels (sometimes covering the entire ceiling) above which fluorescent tubes are installed. Such a system should be designed so that the entire panel is uniformly bright. Similar luminous wall panels are also attractive in some interiors.

Another system of lighting a hotel lobby utilizes a pendant unit which combines the direct and indirect. This is achieved by the use of a suspended housing from which light is projected to the ceiling, while at the same time light is controlled downward through lenses or metal louvers located at the bottom of the lighting unit.

Cove lighting is excellent for atmospheric and dramatic effects but may be considered a relatively expensive system to install, as well as more costly to operate and maintain. Cove lighting is especially attractive in such rooms as cocktail lounges and bars where one is seeking to create an appropriate mood for the convivial guest.

Decorative chandeliers of different designs, including the crystal type, are often used in some types of lobbies. The bulbs used in chandeliers should be shielded or of very low brightness, in which case they become decorative elements, with most of the illumination provided by other hidden equipment.

Downlights, installed flush with the ceiling, are being used extensively in many lobbies. The designer may guard against large differences in brightness between the light source and the ceiling by using low brightness apertures (deep shielding) and by supplementing the system with other general illumination. Downlighting alone is unflattering to the guest, because of harsh facial shadows, but it can be combined effectively with either cove lighting or decorative chandeliers. The downlights

Figure B-8. Coves and recessed downlights are used for general lighting and for casual reading.

Figure B-9. (right). An elevator lobby lighted by recessed egg-crate fluorescent units.

Figure B-10. An elevator lobby lighted by silvered-bowl lighting units similar in principle to the lighting system shown in Fig. B-2, except that the unit has its own reflecting surface recessed above the ceiling.

Figure B-11. (right). Cove lighting gives pleasant diffused low-level illumination, while recessed downlights give high-level illumination for safety.

Figure C-1. Large translucent panels with light sources behind may be used either in the ceiling (above) or a side wall (right).

Figure C-2. House telephones with lighting units recessed above them.

provide light efficiently, while the cove or chandelier enhances the decorative treatment and provides some diffuse lighting to soften the concentrating distribution of the downlights.

C. Front Office

Adequate and attractive front office lighting is a good investment, for this is the first place the guest seeks when entering the hotel lobby and it is here that he returns from time to time during his stay for mail, for his key and for pertinent information. Accordingly, a high level of illumination (see Table I) is essential for this area in the center of lobby traffic. Office lighting units can be used quite successfully for this facility. Often the ceiling units can be recessed, using either fluorescent or incandescent light sources. (Care should be taken that light is provided on the ceiling.) Large area luminous panels are also appropriate.

Figure C-3. Silvered-bowl bulb luminaires, cove lighting and recessed downlights over the counter.

Figure C-4. Front office (left) lighted by seven recessed units. Office (right) lighted by four silvered-bowl recessed units with three downlights over the counter. A fourth spot highlights the house telephone at the left.

Hotel accounting and general administrative offices require illumination similar to that in other commercial and industrial offices as outlined in the I.E.S. "Recommended Practice for Office Lighting."

D. LOUNGE

Lounge lighting is more than a matter of footcandles and wattages; it is a matter of a pleasant relaxed environment. The designer, the illuminating engineer and the hotel manager should all work together as a team to achieve the ideal solution. Generally pleasing patterns of lighted surfaces, combined with attractive color treatment, provide the solution.* Lounge lighting calls for a softer

*See Chapter 6, Color in Lighting.

Figure C-5. (above). Auto registration desk with built-in local fluorescent lighting.

Figure C-6. (left). Providing meeting rooms is an important function of hotels. The lighting should be in accordance with office lighting.

Figure D-1. Indirect lighting from coves around the columns and edges of lounge area plus recessed downlights. Table lamps provide reading light.

Figure D-2. Lounge area with general lighting provided by large indirect bowls throwing light to ceiling.

Figure D-3. General illumination from cold cathode coves, 12 inches deep and 14 feet apart. The decorative glass-topped tables are accented by 500-watt spots recessed in the ceiling. End wall is lighted by a cornice with six 40-watt fluorescent tubes.

Figure D-4. Fluorescent tubes are mounted above this diffusing glass ceiling. Vertical baffles reduce panel brightness as viewed sideways.

Figure D-5. Lounge area mural is lighted from above by fluorescent tubes concealed behind a ventilating duct.

Figure E-1: a and b. Typical corridor lighting on guest room floors using fluorescent.

treatment than main lobby lighting, with localized portable lamps at certain points for reading purposes. One simple way to achieve good general illumination in such areas is to combine downlights with portable lamps which have an upward component. Properly located electrical outlets must be provided in the early planning stages.

Good directional signs that are both visible and legible from a distance are important adjuncts to any successful layout. See Section K.

Provision should be made for special electrical outlets to take care of temporary spot lights for exhibits, special occasions and the like.

E. Corridors

In lighting corridors, the designer must avoid a gloomy atmosphere. A cheerful, well-lighted corridor presents a pleasing effect as a guest approaches his room or when he leaves it. Warm colors of surfaces and light sources (see Chapter 6) are more attractive at the low illumination levels usually used in corridors. Adequate corridor lighting makes it much easier to read room numbers and find the door locks. If possible, corridor lights should be spaced so they are located near guest room doors.

Brightly colored walls and ceilings have the ad-

Figure E-1: c, d, e. Typical corridor lighting on guest room floors using incandescent.

vantage of creating the illusion of space which, in the case of long and narrow corridors is most desirable. Either fluorescent or incandescent light sources can be used, depending upon the decor of the over-all scheme established for the hotel proper. Shielded fluorescent tubes can be used in continuous strips or as separate units placed at proper intervals. Incandescent bulbs can be used successfully in either semi-indirect or indirect lighting units.

Well-designed units on a corridor ceiling, when installed at intervals of approximately twice the ceiling height, usually give adequately uniform illumination under normal conditions. Whenever possible, deep shadows, which are often created by transverse beams, should be eliminated by suitable placement and upward light from the lighting unit.

National and local codes require emergency lighting for hotel corridors which will operate in the event of failure of the primary source of electricity. These codes should be consulted.

F. Guest Room

This is a discussion of ways to provide better and more attractive lighting for the hotel guest room. Frequently a guest room is used for small business conferences and entertaining. Wherever possible it should be furnished, decorated and lighted to serve as a living room, and as well as a room where the guest may work and sleep. All of these various functions demand different types and locations of the lighting equipment.

The lighting of a guest room should provide for the following:

General room illumination,
Writing at a desk,
Reading in bed,
Reading in an easy chair,
Grooming at the dresser or dressing table,
Illumination in clothes closets.

General Room Lighting

To be able to see the entire room at a glance upon entering is a safety factor and one which creates a feeling of well-being in the guest. Just inside the guest room door, a wall switch should control at least one of the following: one or more ceiling units; or portable lamps — floor, table, or wall; or some other form of lighting such as valance, cornice, or cove, to produce lighting throughout the room. For deluxe accommodations, some of the room lighting may be controlled by a dimmer, but dimmers should not be used for entrance lights.

Ceiling Units. If general room lighting is to be

Figure F-1. Ceiling fixture controlled by entrance wall switch provides general illumination in this suite bedroom. Tall lamp on bedside table distributes light over both beds for comfortable reading.

provided by ceiling units, *shielded* units should be chosen; for example, see Fig. F-1. Exposed bulbs are glaring and annoying, and mar the attractiveness of the interior. Lighting units with a glass, plastic or metal bowl which directs most of the light upward will provide pleasant general lighting if equipped with bulbs totalling 150 to 200 watts. However, with units providing a large amount of upward light, ceilings must be light in color with a dull or flat finish (not glossy). Lighting units employing a silvered-bowl bulb provide totally indirect lighting. Since the bowl end of the bulb is silvered, every time the bulb is replaced a new reflecting surface is provided. Since units with silvered bowl bulbs give totally indirect lighting, a white, non-glossy ceiling is important. (Only a silvered bowl bulb should be used in a unit designed for such a bulb.)

Portable Lamps. Where management does not desire a ceiling unit for general lighting, over-all room lighting can be produced by portable lamps. It is essential that several lamps be connected to wall outlets that are controlled by a switch at the door entrance. Portable lamps connected to outlets controlled by an entrance wall switch should not have switches on the lamps. It is presumed that if adequate local lighting is provided by proper portable lamps at the bed, desk, chair, and dresser, there will be sufficient general room lighting without a ceiling unit. Each lamp therefore must emit some light upward as shown in Figs. F-2 and F-4. Types of floor, table and wall lamps and recom-

Figure F-2. Living room (same suite as Fig. F-1) with local and general lighting provided by four large-scale portable lamps with open-top shades. Light ceiling and walls reflect pleasant light throughout the interior.

Figure F-3. (below). The attractiveness of room colors, fabrics and furnishings in this twin guest room are lost in darkness with the bullet-type lamps shown. Desk lighting is glaringly uncomfortable, and adjustment of the bullets for comfortable bed lighting for one occupant may result in direct glare to the other. For comfortable lighting and best decorative effect do not select lighting units of this style.

Figure F-4. (above). Relighting the bedroom shown in Fig. F-3 creates a far more cheerful atmosphere. Floor and table lamps with open-top shades provide glare-free general and local lighting.

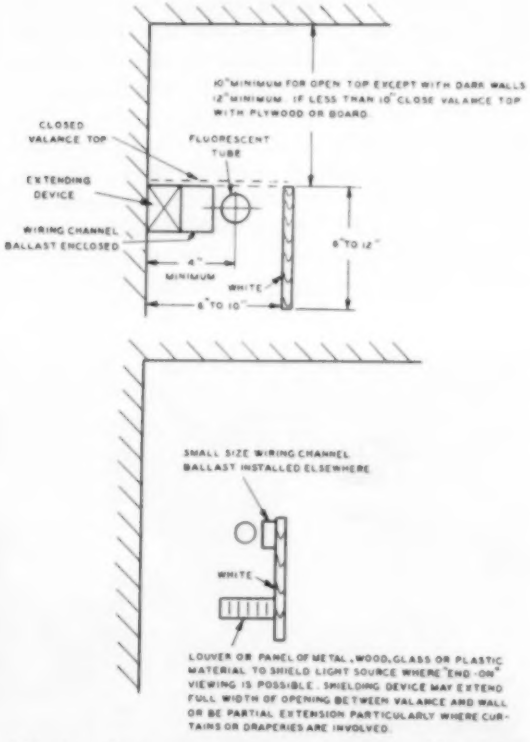

10" MINIMUM FOR OPEN TOP EXCEPT WITH DARK WALLS
12" MINIMUM IF LESS THAN 10" CLOSE VALANCE TOP WITH PLYWOOD OR BOARD
CLOSED VALANCE TOP
FLUORESCENT TUBE
EXTENDING DEVICE
WIRING CHANNEL BALLAST ENCLOSED
4" MINIMUM
WHITE
6" TO 10"
6" TO 12"
SMALL SIZE WIRING CHANNEL BALLAST INSTALLED ELSEWHERE
WHITE
LOUVER OR PANEL OF METAL, WOOD, GLASS OR PLASTIC MATERIAL TO SHIELD LIGHT SOURCE WHERE "END-ON" VIEWING IS POSSIBLE. SHIELDING DEVICE MAY EXTEND FULL WIDTH OF OPENING BETWEEN VALANCE AND WALL OR BE PARTIAL EXTENSION PARTICULARLY WHERE CURTAINS OR DRAPERIES ARE INVOLVED.

Figure F-5. Example of a fluorescent wall bracket (continuous fluorescent strip shielded by perforated hardboard shield) used on a light colored wall to provide general lighting. If the bracket were lowered to about 30 inches above mattress tops, more light would be available for reading in bed. The bullet is not recommended. Drawing at right shows cross-section of lighted valance with critical construction details.

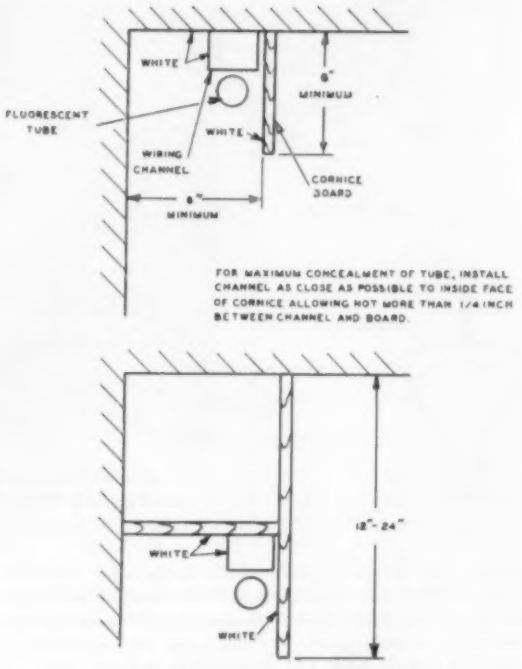

WHITE
FLUORESCENT TUBE
WIRING CHANNEL
WHITE
6" MINIMUM
CORNICE BOARD
6" MINIMUM
FOR MAXIMUM CONCEALMENT OF TUBE, INSTALL CHANNEL AS CLOSE AS POSSIBLE TO INSIDE FACE OF CORNICE ALLOWING NOT MORE THAN 1/4 INCH BETWEEN CHANNEL AND BOARD.
12"-24"
WHITE
WHITE
DEEP CORNICE VARIATION ESPECIALLY APPROPRIATE FOR HIGH CEILINGS.

Figure F-6. Cornice installation in a hotel living room. Cross-sections (right) show critical construction details of lighted cornices.

mended wattages are discussed for the various locations described in the following pages. When lamps are attached to furniture to prevent tipping and breaking, it is especially important to the comfort of guests that the positions specified be followed.

Valances, Cornices and Coves. Where linear lighting sections are used, fluorescent equipment (tubes and ballasts) of the instant-start or rapid-start type is recommended. Fluorescent tubes of the warm type with red color correction (complimentary to complexions) should be used. Figs. F-5, F-6, and F-7 show three types of linear lighting. Lighted valances are horizontal strips of wood, metal, plastic or other material mounted across window tops or along walls with concealed light sources behind them. Cornices (see Fig. F-6) are moldings attached to the ceiling approximately 6 to 8 inches from the wall to shield light sources and provide totally direct lighting. Fabric, paint, or wallpaper, if light in color, will reflect light from valances or cornices to provide general room illumination. Coves are mounted on the upper walls to conceal light sources and provide indirect lighting.

For proper lighting results with lighted valances, cornices, and coves, it is essential that the dimensions and instructions given in Figs. F-5 to F-7 be followed.

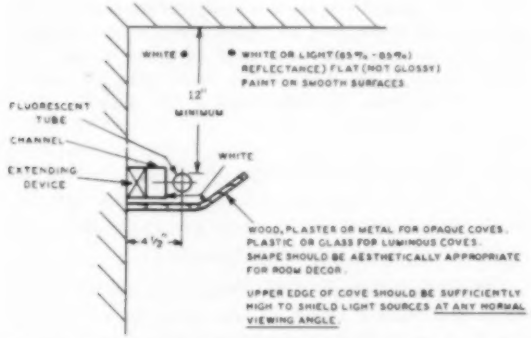

WHITE *
* WHITE OR LIGHT (85% - 89%) REFLECTANCE) FLAT (NOT GLOSSY) PAINT ON SMOOTH SURFACES.
12" MINIMUM
FLUORESCENT TUBE
CHANNEL
EXTENDING DEVICE
WHITE
4 1/2"
WOOD, PLASTER OR METAL FOR OPAQUE COVES. PLASTIC OR GLASS FOR LUMINOUS COVES. SHAPE SHOULD BE AESTHETICALLY APPROPRIATE FOR ROOM DECOR.
UPPER EDGE OF COVE SHOULD BE SUFFICIENTLY HIGH TO SHIELD LIGHT SOURCES AT ANY NORMAL VIEWING ANGLE.

Figure F-7. Cross-section of lighted cove showing critical construction details. Upper edge of cove should be sufficiently high to shield light sources at any normal viewing angle. For good distribution of light on the ceiling, upper edge of cove should be located so that it does not interfere with a line from lowest part of light source to most remote point of ceiling. For a continuous line of light, fluorescent tubes should be installed with lamp holders (sockets) "back-to-back."

Lighting the Desk

The writing desk may be the place of most critical seeing in a hotel room. In desk lighting *avoid:*

Wrong placement of the lamp and desk,

Use of an inadequate size bulb,

A gooseneck bullet-type lamp or a too-short conventional lamp,

A desk with a highly polished surface or a glass top.

For good desk lighting the following factors should be considered:

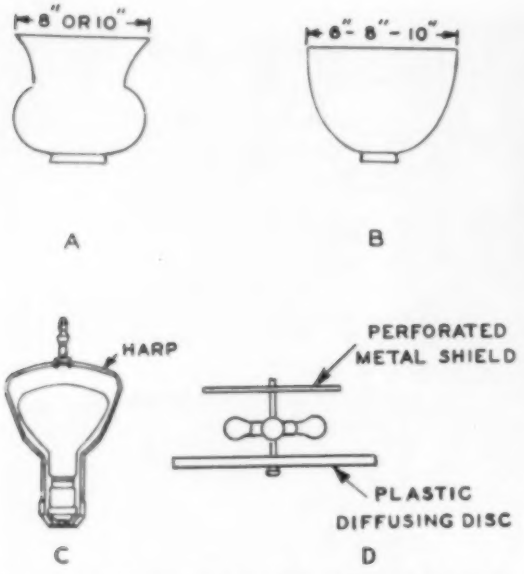


Figure F-8. Types of under-shade designs for portable lamps. A is a one-piece glass reflector 8 or 10 inches in top diameter; B is a glass reflector 8 or 10 inches in top diameter (6-inch plastic reflectors are also available); C shows a wide harp and R-40 white indirect bulb; D illustrates three bulbs above a diffusing disk.

Choice of Lamp Style. Table, floor, or wall type lamps may be used. Regardless of the type of lamp, there are four acceptable "under shade" designs as shown in Fig. F-8. Design A is an all-glass diffusing bowl; design B may be glass or plastic; both provide *pleasant, glareless* downlighting as well as indirect lighting. Design C uses a wide harp (a sturdy wire shade support) to accommodate a bulb of "mushroom" shape that has a white inner coating to reduce glare and provide direct and indirect lighting. Design D uses a diffusing disk below one or more bulbs. If the top of the lamp shade is less than 58 inches above the floor, the bulb(s) should be shielded from above.

A too-short and too-small lamp, often chosen because desks are much too small, gives only a confined circle of light around the base of the lamp. To produce a spread of useful light over the desk surface, a lamp should preferably have a shade about 16 inches in diameter at the bottom. The lower edge of the shade should be about 15 inches above the desk top.

Correct Placement of Lamp and Desk. A well-designed lamp poorly placed is a waste of light. Locating the lamp on the left side of the desk (assuming guest is right-handed) places the shadows back of the right hand and not across the writing page. If wall-mounted lamp is used, or a floor lamp

Figure F-9. The travelling business man or woman will appreciate good desk lighting. Here a lamp with diffusing bowl is permanently attached to the wall at the recommended location.

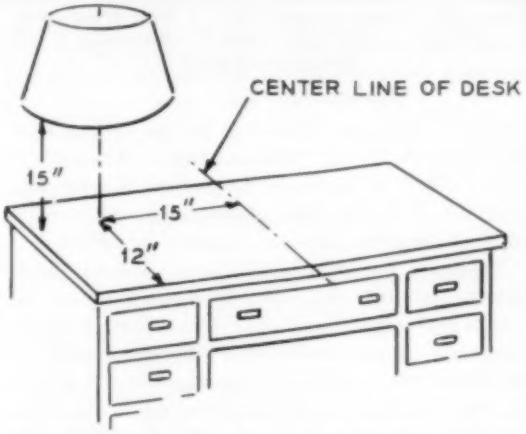


Figure F-10. For best lighting distribution and eye comfort for desk work, the lower edge of the lamp shade should be no lower than 15 inches above a 30-inch-high desk. The lamp should be located 15 inches to the side of the center of the desk and no more than 12 inches back from the front edge of the desk.

of the proper size, these also should be located at the left side of the desk. Do not place the desk in front of a window or at such an angle that the seated guest looks into bright daylight.

The Proper Size of Light Bulb. In lamps designed with under-shade units, A, B, or C, as shown in Fig. F-8, use a three-light 50-100-150-watt medium screw base bulb. Bulbs with single filaments, 150 watts, may be used if the lamp is wired with a single position switch. Use three 40-watt bulbs in a lamp employing three sockets (D in Fig. F-8).

Lamp Switch. A turn or push-type switch installed on the base of the desk lamp instead of a switch on the socket up under the shade is recom-

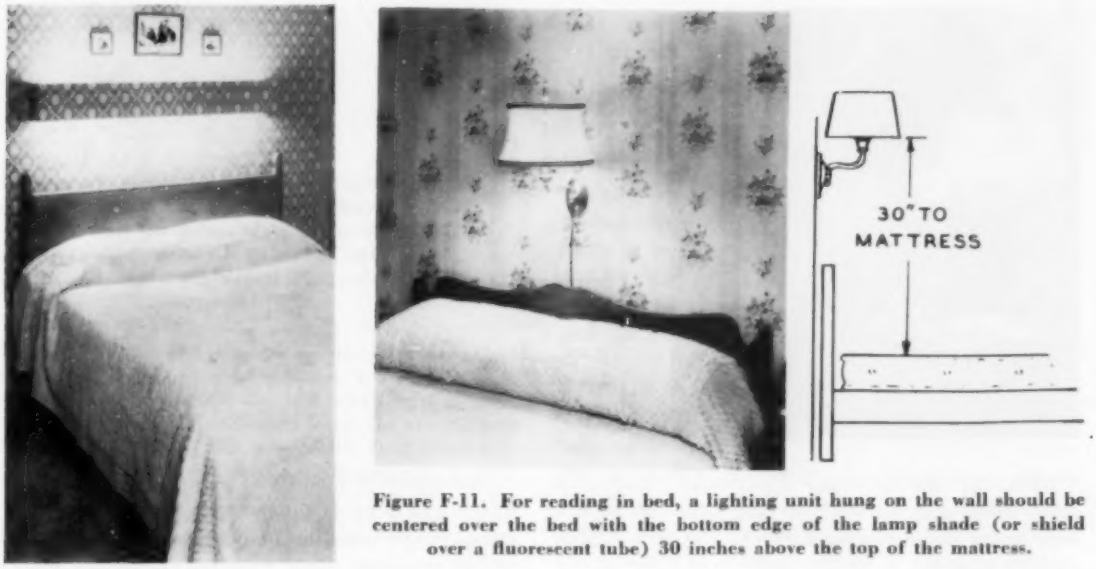


Figure F-11. For reading in bed, a lighting unit hung on the wall should be centered over the bed with the bottom edge of the lamp shade (or shield over a fluorescent tube) 30 inches above the top of the mattress.

mended. The guest can see the light switch and does not have to reach under the shade. Touching a warm socket or bulb and tipping the lamp is then less likely. If lamps now in use have two sockets or narrow harps, use white* bulbs for less glare.

Desk Finish. A highly polished surface or a glass top used to protect the wood surface reflects the bright light bulb image into the user's eyes. This glaring condition is annoying and should be avoided. Light colored finishes are preferred. Desk tops of dark finishes or high gloss can be covered by light-colored desk blotters, or by applying a new top of some non-shiny light-colored durable material.

Light for Reading in Bed

Good light for reading in bed should be provided for the many guests who enjoy reading themselves to sleepiness. The conventional metal unit hung on the headboard, even though adjustable, does not give satisfactory lighting. Such units require the reader to assume uncomfortable positions in an attempt to put the reading matter under the light and at the same time to keep the light out of the eyes. Furthermore, they leave the rest of the room in darkness, producing an uncomfortable visual contrast. One good rule to follow is: *Do not hang or attach a reading lamp to the headboard of the bed.*

For lighting to be satisfactory for reading in bed, it should be designed to light the complete page, permit a comfortable reading position, keep any annoying source of brightness from the reader's eyes, and give some general room illumination.

*Silica-coated.

There are two placements of the lighting equipment for best results: on the wall over the head of the bed, or on a table beside the bed.

Wall Lamp. Wall-attached lamps should be centered over the head of the bed with the bottom edge of the shade or valance board which shields the light source about 30 inches above the mattress. See Fig. F-11. The guest can then sit in a comfortable reading position with light on the reading matter, and the source of light is above and in back of his head out of his line of vision. The bottom diameter of the shade on a wall lamp should be about 13 inches.

While such a placement of the lighting unit is excellent for the reader, it is perhaps objectionable to some hotel operators since it establishes a definite bed location. Where rooms are static, this is not a significant problem. Where space is at a premium with no table area beside the bed, wall-mounted devices are an ideal solution.

Table Lamp. The more conventional method of providing light at the bed is to place a table lamp beside a bed or between twin beds. Too often the lamp is not tall enough, or it is of such design that it is better to look at than to read by. Bedside lamps and tables will vary in height; their combined height should locate the bottom edge of the lamp shade about 20 inches above the mattress, as shown in Fig. F-12. This is approximately the eye-height of a person reading in bed in a comfortable position. Such lamp height (mattress top to bottom of shade) provides good illumination on the reading page. A table lamp shade should be about 16 inches in bottom diameter.

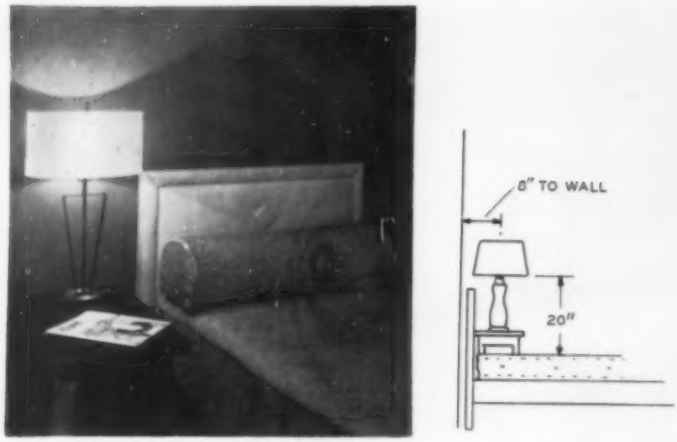


Figure F-12. A table lamp to be used for reading in bed should be located with its center eight inches out from the wall. The bottom of the lamp shade should be about 20 inches above the top of the mattress.

Choice of Bed Lighting Equipment. Wall and table lamps may be selected that have one of the four under shade designs shown in Fig. F-8. These provide pleasant, glare-free downward light on the reading page and also upward lighting of the room. This combination of downward and upward lighting produces a brightness relationship between the page and its background which is comfortable to the reader. This cannot be said of the concentrating downlighting produced by units attached to the headboard or by bullet-lights and others of similar designs (see Fig. F-3).

Use lamps with under-shade designs as shown in Fig. F-8 and the bulb sizes recommended below:

Wall Lamps: Use 150-watt inside frosted; or 150-watt indirect bulb; or 50-100-150-watt three-light; or three 40-watt bulbs.

If a fluorescent tube is used in a wall unit, use 25-watt tube over a single bed, and a 40-watt tube over a double bed.

Light for the Easy Chair

In most guest rooms there is usually at least one comfortable reading chair with a lamp beside it. The old fashioned down-turned bridge type lamp gives unsatisfactory lighting.

A floor lamp with one of the four under-shade designs (preferably Type A, B, or D) shown in Fig. F-8 is recommended. Such a lamp provides both diffused downward light for reading and upward light for room illumination. If placed to the left of the desk between the desk and a chair, one properly designed floor lamp can light both the desk and the chair as shown in Fig. F-13.

When a table lamp is used beside a chair, the combined height of the lamp and the table should be such that the bottom of the shade is about even with the average seated eye-height of the person reading. This should place the bottom of the lamp shade between 40 and 42 inches from the floor.

Dimensions of lamps and recommended bulb sizes which will provide pleasant reading light for the guest, whether reading is done at a chair, desk, or in bed are listed below:

Large Floor Lamp

Floor to bottom of shade	49 inches
Diameter of shade	18 inches
Bulb size	Use 100-200-300-watt three-light in 10-inch reflector bowls A and B. (See Fig. F-8.)

Junior Floor Lamp (also Bridge, or Swing-Arm Styles)

Floor to bottom of shade	47 inches
Diameter of shade	13 to 16 inches

Figure F-13. Where space and/or budget is limited, one well-chosen and well-placed floor lamp can light both the desk and an easy chair.

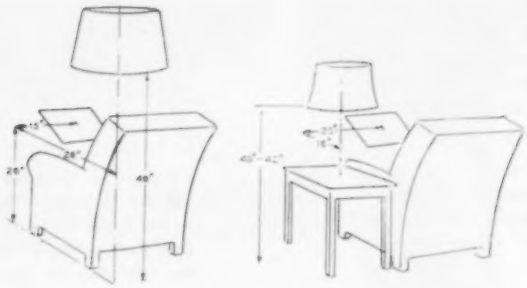


Figure F-14. Where lamps are permanently secured to the floor, wall or a piece of furniture as shown in these sketches, the proper location will insure best lighting results. For floor and wall-hung lamps the vertical axis through the center of the lamp shade (not necessarily through the lamp shaft) should be 26 inches in back of the reading material and 15 inches to one side of the center; table lamps should be located 16 inches behind and 20 inches to the side. Normal seated positions in average upholstered furniture place the center of the printed page (tilted toward the reader) about 26 inches above the floor. The bottom of a floor lamp shade should be about 49 inches above the floor, 40 to 42 inches for a table lamp.

Bulb size ..... 150-watt or 50-100-150-watt three-light, in 8-inch reflector bowls A and B. 150-watt, or 50-100-150-watt three-light R-40 white indirect bulb in wide harp; or three 40-watt bulbs. (See Fig. F-8.)

Table Lamp

Beside chair ..... bottom of shade 40-42 inches above floor

Beside bed ..... bottom of shade 20 inches above mattress top

On desk ..... bottom of shade 15 inches above desk top

Diameter of shade ..... 16 inches

Bulb size ..... See recommendations above under Junior Floor Lamp

Lighting for Grooming at the Dresser Or Dressing Table

Feminine guests will appreciate lamps on the dresser and dressing table that will light each side of their faces. Proper height of lamps is essential, and the height will differ for a dresser or a dressing table. Shades should be translucent so that the face is illuminated by the light passing through them. A pair of lamps should be used. See Figs. F-15 and F-16.

The lamps on a dresser before which a guest stands should be about 19 inches high, from dresser top to bottom of shade. Where a large double dresser is used, the lamps can be of larger scale, similar to the dimensions given for table lamps. On a dressing table at which a guest is seated, lamps should be about 13 inches high from dressing table top to bottom of shade.

Bottom shade diameter should be at least 9½ inches. Shades should be white, light ivory, or pale flesh tones. Restrict deeper color to top and bottom shade trim. Use a 75-watt, 100-watt, or a 30-70-100-watt three-light bulb.

Lighting Clothes Closets

A light in a closet is a convenience the guest appreciates. A socket may be installed on the wall above or beside the door, or on the ceiling to accommodate from a 60- to 100-watt bulb, depending on the size of the closet. It may be controlled by a pull chain, wall switch, or automatic door switch.

When the closet opens into the entryway, a lighting unit located on the entry ceiling opposite the

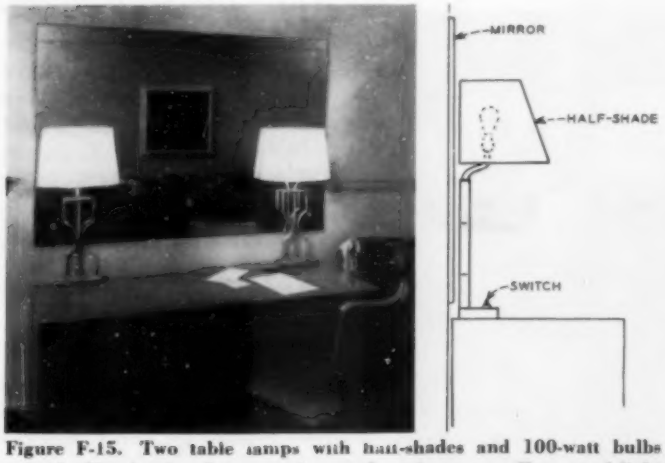


Figure F-15. Two table lamps with half-shades and 100-watt bulbs provide illumination for grooming at the mirror as well as good light for desk work.

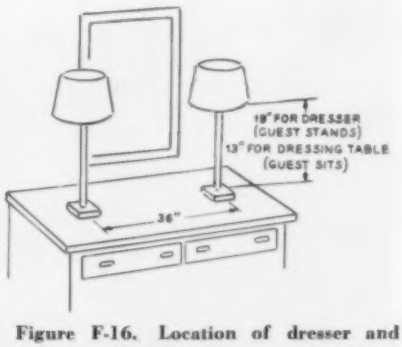


Figure F-16. Location of dresser and dressing table lamps for conventional furniture.

Figure F-17. (left). Bulbs with the bowl-end finished in a pale yellow enamel (known as GA bulbs) can be used in exposed bulb lighting units such as these. These bulbs reduce glare and are designed to be used unshaded.

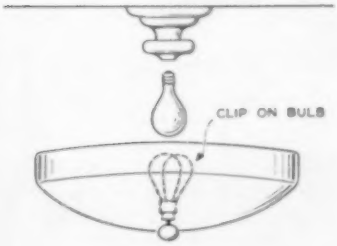


Figure F-18. (right). Obsolete fixtures with glaring exposed bulbs can be transformed into pleasing, glareless luminaires by the use of adapters concealing the bulbs.

closet door will do a fair job of lighting the closet. Some entry lighting units are designed to project a beam of light into the closet.

Inexpensive Ways to Improve Existing Guest Room Lighting

1. Reduce glare and provide more adequate general lighting from exposed bulb ceiling units by:
   (a) Using 50-watt, GA-25, decorated enamel bowl bulbs in multiple socket units; 100-watt GA bulbs in single socket units. See Fig. F-17
   (b) Use an adapter (Fig. F-18);
      (1) glass or plastic
      (2) metal for use with silvered bowl bulbs.

2. Modernizing floor and table lamps with a wide harp as shown in Fig. F-19 to accommodate an R-40, white indirect bulb. Shades should have proper dimensions. They may be translucent or opaque. The linings should be light in color.

3. Using a table or floor lamp, or some type of lighting attached to the wall over the head of the bed, if no light is provided at the bed. (See Figs. F-11a, F-11b, and F-12a.)

4. Placing lamps of good lighting design on desk, dresser, and beside beds at proper locations.

Figure F-19. Old, yet attractive floor and table lamps can be modernized as shown here. Former double socket at left has been replaced at right with a single socket and wide harp for an R-40 white indirect bulb.

Figure F-20. Unsightly windows are hidden behind translucent plastic screens, transilluminated by fluorescent tubes at the top and bottom.

Figure G-1. In the remodeling of this hotel bathroom, the old-fashioned over-mirror lighting bracket with its single low-wattage bulb was replaced by this decorated-glass unit using two 60-watt "white" bulbs. However, to meet adequate lighting standards, see Fig. G-3.

Figure G-2. Where recessing into the wall is undesirable large wall-hung medicine cabinets are often used. This one comes complete with one 25-watt fluorescent tube across the top behind the perforated metal shield. Shield has open top to provide some general room lighting.

G. Guest Bathroom

The most important mirror to a guest, and the one most subjected to criticism from a lighting standpoint, is the one in the bathroom. Lighting equipment at the mirror should direct light toward the person, not on the mirror. The conventional open-bottom glass "cup" unit located directly over the mirror produces annoying glare and harsh shadows on the face and under the chin.

If for reasons of economy in remodeling, additional electrical outlets are not possible, a shielded over-mirror unit using two 60-watt bulbs (Fig. G-1), or one 25-watt fluorescent tube (Fig. G-2), will provide more comfortable lighting.

In new construction or where extensive remodeling is being done, two electrical outlets — one on each side of the mirror — are suggested. Locate the outlets 60 inches above the floor and not more than 30 inches apart. This placement of wall units illuminates both sides of the face and under the chin. Use one 60-watt bulb per wall bracket in opal glass shades or two 40-watt bulbs per bracket if shielded by a vertical glass panel. If 15-watt, one-inch diameter (T-8) fluorescent tubes are used, they should be shielded by glass or plastic. If the one-and-one-half-inch diameter tube (T-12) is used,

Figure G-3. Light on both sides of the mirror is better than lighting from a single over-mirror unit. These 20-watt fluorescent tubes are covered by plastic shields that clip over the tubes.

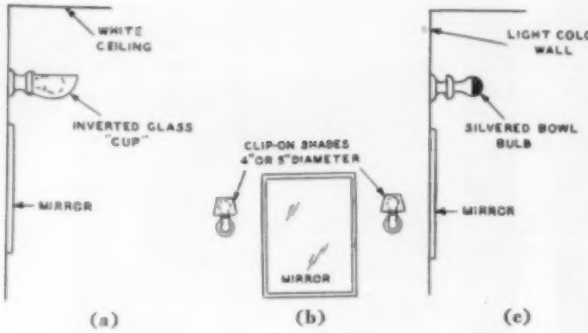


Figure G-4a. Open-bottom opal glass "cup" inverted to diffuse light. This requires a 75- or 100-watt bulb. This is an improvement, but is not up to recommended lighting practice.

Figure G-4b. Clip-on shades used to shield 60-watt bulbs on each side of mirror.

Figure G-4c. Silvered-bowl bulb (100 watts) above mirror provides improved lighting over that obtained with unshielded clear or frosted bulbs.

even though its larger diameter lowers the brightness somewhat, it too should be shielded.

When the size of the bathroom exceeds 40 square feet, a lighting unit on the ceiling is recommended. If it is located on the ceiling at about 12 to 18 inches from the wall directly over the wash stand, it will provide added illumination on the head and face as well as providing general room lighting. In large bathrooms of over 60 square feet, additional units may be desired over the tub or shower. Vapor-proof units are recommended for this location.

The lighting unit or units at the mirror, or ceiling unit, should be controlled by a wall switch just inside the bathroom door. An outlet for an electric shaver is a necessity. It may be incorporated in the lighting bracket if a separate wall outlet is not provided for the purpose.

Inexpensive Ways to Improve Existing Bathroom Lighting

A. Where an open-bottom opal glass shade is located over mirror, turn the shade so the opening is at the top. Use a 75-watt or 100-watt bulb. Light will then be diffused downward through the opal glass shade reducing glare and shadows. Ceiling and walls should be painted white or near-white. See Fig. G-4a.

B. Replace old style over-mirror unit with one of the following:

1. A glass-shielded two-socket bracket to accommodate two 60-watt bulbs. See Fig. G-1.
2. A fluorescent tube at least 33 inches long (25-watt) with plastic, glass, or some other shielding media. See Fig. G-2.

C. If brackets at each side of mirror have exposed bulbs, use one 60-watt bulb per bracket and white plastic clip-on shades four or five inches in *bottom* diameter. See Fig. G-4b.

D. If sockets above or on each side of the mirror accommodate bulbs in a horizontal position with the guest looking directly into the bowl-end of bulb, use silvered bowl bulbs — 100 watts over the mirror as shown in Fig. G-4c, or 60 watts beside the mirror.

Figure H-1. Dining room with bar lighted by chandeliers and wall brackets directing light to the ceiling. Note recessed units over the bar.

H. Dining Room and Bar

The level of illumination for dining rooms should always be high enough so that guests can read the menu without straining their eyes. In the past, incandescent light sources have proved to be more appropriate for dining room areas. Now, improved-color fluorescent tubes are also satisfactory in this area.* The design of the lighting units should conform to the general decorative scheme of the room in both color and character.

An interesting method of lighting dining rooms, bars and cocktail lounges is by the use of mural decorations applied to brightly lighted walls. This scheme of lighting can be inexpensively achieved by dropping a continuous baffle strip from the ceiling, close to the walls, so placed as to conceal light sources from direct vision. Behind the baffle strips

*Refer to Chapter 6 for a more complete discussion of color. (Page 395.)

Figure H-2. Lunch counter with recessed glass-covered fluorescent (rectangular) and incandescent (square) lighting units.

Figure H-3. Traditional dining room with well-shaded chandeliers, wall brackets and table lamps along wall.

Figure H-4. Coffee shop with attractive lighting units providing both direct and indirect lighting. The disks above the units are white to reflect the maximum amount of light down to the tables.

Figure H-5. (left). Bar with lighted cove and downlights.

Figure H-6. Dining room illuminated by ornamental incandescent luminaires with upward and downward components.

Figure H-7. (left). Ceiling cove (with incandescent bulbs) is supplemented by spot lights. The crystal chandeliers are decorative, but they provide only negligible illumination.

Figure H-8. Dining room with fluorescent ceiling coves and concealed lighting above murals. Note also supplementary downlights around ventilating device.

Figure H-9. Dining room illuminated by recessed downlights. Note also the two units lighting the mural.

either fluorescent or incandescent lighting can be installed. See information on cornices and valances in Chapter 3 F.

The middle portion of the room can be illuminated by the use of standard or specially designed downlights. Small table lamps and occasional candles add a note of charm to dining rooms and cocktail lounges.

Coves are also attractive in dining and similar areas, although they provide low level illumination on the tables.

Many variations of bright area patterns on the ceiling are being used to produce general area lighting and decor.

In layouts where the bar is used as a dining room during normal eating hours and then turned into a cocktail lounge at other periods of the day and night, it is advantageous to consider the installation of a flexible lighting scheme which can produce either a high level of illumination or a low level, as may be required. This can be achieved through the use of partial switching or dimmers. It should be noted that the atmospheric mood for dining is not always appropriate for the cocktail hour. Fluorescent tubes can now be dimmed as effectively as incandescent bulbs. (See page 393.)

Figure H-10. Combination of cove lights and recessed downlights.

Figure H-11. (right). Cafeteria with downlights over the serving areas.

Figure I-1. (above and left). Hotel kitchens lighted by continuous lines of glass-covered fluorescent units recessed in the ceiling.

I. KITCHENS*

In the application of light to modern kitchens there is one very serious problem which probably cannot be completely overcome, *i.e.*, the problem of reflections from highly polished surfaces such as stainless steel. Large lighting units with low brightness should be used; for example, fluorescent or large area incandescent sources. Thirty footcandles is recommended for all areas except those used for inspection, checking and pricing, where seventy footcandles is desirable. Improved-color white fluorescent lamps or incandescent lamps should be used.

There are several areas in the kitchen which require special attention in lighting; one is in the meat preparation room where a band saw is used. If the machine casts a shadow, it is necessary to break down the shadow either with auxiliary lights near the band saw or with spot or floodlights mounted at ceiling height. Another area requiring special lighting is under the range hoods. The solution here is basically one of using a vapor-proof lighting unit not affected by steam which will withstand high temperature. For this use, incandescent bulbs enclosed by glass sealed covers find wide application. A third important area for special lighting is at the clean-dish tables where silver and glassware are inspected.

Additional attention to illumination may be required in the areas where clerical duties must be performed quickly and accurately. One of these spots is the checker's stand which requires accurate scanning of tray contents together with checking them against a guest order.

Beyond these several areas, the chief problem in the kitchen is color rendition* and adequate light for operating functions and for cleaning.

While a working height of 34 inches off the floor is usual for kitchens, it is equally important to remember that floors must be well lighted to aid in cleaning. It is particularly important, too, that the vertical faces of ovens and ranges be well lighted to prevent cooks from getting burned. The areas where machinery, particularly food choppers and mixers, is used should be well lighted to insure safety and cleanliness.

Attention should be given to the form of the lighting unit, avoiding horizontal surfaces on which dust and dirt may collect. Since kitchen lighting units or their reflections in shiny surfaces are sometimes unavoidably in the normal line of vision, it is wise to keep their brightness as low as possible; this may be done by using large diffusing sources.

Either incandescent or fluorescent light may be used effectively. Fluorescent installations should be properly engineered for brightness control and for color quality (improved-color white tubes).* Brightness control is accomplished by shielding the lighting units from the horizontal down to at least 30 degrees below the horizontal.

*For further information see IES Report, "Lighting for Commercial Kitchens" (1956).

*See Chapter 6.

*To maintain the color quality, the management should make sure that improved-color white tubes are used as replacements when that becomes necessary.

J. Service Areas

In service areas there may be many different seeing tasks. In many service areas the visual task is very critical, and improved lighting might well bring about handsome profits in the form of greater efficiency. Such areas would be valet shop cleaning, mail sorting and maintenance shops. However, in the more general service areas such as store rooms and service corridors, the seeing task might not be so critical. In these areas, however, which are often notoriously poorly illuminated, an improvement in the lighting will almost always result in a much cleaner hotel.

Safety is an important problem related to the lighting of service areas. Many accidents in these sections can be attributed to poor lighting. For example: if a service stair-well is so lighted that if one bulbs burns out a segment of the stair-well is in darkness, a serious accident hazard is created. Areas around moving machinery should be well lighted to avoid hazards.

There are many areas in hotels which are visited by personnel only on rare occasions; these include, for example, pipe lofts, plumbing alleys, and hung ceiling spaces. Often the work lights in these areas are accidentally left burning and may burn out; sometimes when a man enters these areas he must first replace all the bulbs. It is strongly recommended, therefore, that for these areas, as well as many other conventional areas, pilot lights be employed to give warning that lights are on at a specific location. Throughout the service areas of the building there are numerous opportunities to use pilot lights advantageously, including walk-in refrigerators.

In many service areas the appearance of the lighting unit is not of great consideration. Under these circumstances the maintenance features of the installation should be the prime consideration in selecting the lighting equipment.

One service area that requires special consideration is the telephone switchboard room. The following general recommendations are consistent with current practice. The determination of the illumination level at the switchboard is dependent on many considerations. However, the primary idea is that there should be sufficient light for reading bulletins and writing tickets. In the switchboard area too much light will eliminate the necessary contrast of the light signals which are of various colors and intensities. Therefore, it is recommended for incandescent illumination that 10 to 15 footcandles be provided; for fluorescent lighting, 15 to 20 footcandles. This distinction arises because the fluorescent color is sufficiently different from the switchboard lights to permit use of higher levels than are tolerated with incandescent.

It is an extremely important requirement, when locating a light source at the switchboard, that the image of the source not be visible on any reflecting surface when the operator is in position. With this in mind, lighting units are usually mounted in a line parallel to the switchboard at a distance of between four and five feet from the switchboard face. These considerations are only for the switchboard

Figure I-2. (left and below). Hotel kitchens with large ceiling-attached luminaires, each containing multiple fluorescent tubes and covered by diffusing glass.

itself. It may well be that other parts of the room will require special treatment. It should be pointed out that the telephone operators are more or less confined to this service area for long periods of time and that a bright and cheery lighting system will certainly improve their morale, and presumably their service to the guests. Uncomfortable environmental contrast can be overcome by avoiding dark finishes on equipment.

K. Interior Illuminated Directional Signs

There are several kinds of directional and location signs in general use.

(1) A decorative metal box with a facing of one-eighth-inch thick opal glass, the background of which is etched and sprayed with opaque color, so the lettering stands out in clear white opal glass. This type of sign is usually illuminated by a fluorescent tube, located inside the box at a distance behind the sign face to give relatively uniform brightness the full height of the illuminated letters.

(2) The edge-lighted sign made of plate glass with letters etched upon it, inserted into the groove of a housing having a fluorescent tube either on the top or bottom of the sign.

(3) A metal box with a metal facing from which letters are cut out. Plastic sheets or letters are slipped in from behind these openings and illuminated by fluorescent lighting on the inside of the box. When alternating current is not available, these signs can be illuminated quite satisfactorily by incandescent bulbs, preferably 40-watt on six-inch centers.

(4) Luminous background and silhouette signs employing incandescent filament or fluorescent light sources enclosed with glass or plastic to produce a luminous background upon which are painted opaque letters or against which are placed formed block letters, both of which appear either in contrast or silhouette.

For further treatment of sign lighting see the *IES Lighting Handbook*.

Figure L-1. Marquee with metal letters silhouetted against lighted cove. Sidewalk area is illuminated indirectly from 36 luminaires with silvered-bowl 150-watt bulbs.

L. Marquee

The marquee, when properly designed and lighted, can be a powerful and inviting medium for advertising the hotel. It is this feature that first attracts the attention of the guest as he approaches the hotel either by motor or on foot. It is the hotel's sign of welcome, and, therefore, the first impression should be a favorable one. Competition in the area and the atmosphere of the hotel have more influ-

Figure L-2. Marquee with luminous background sign and recessed downlights.

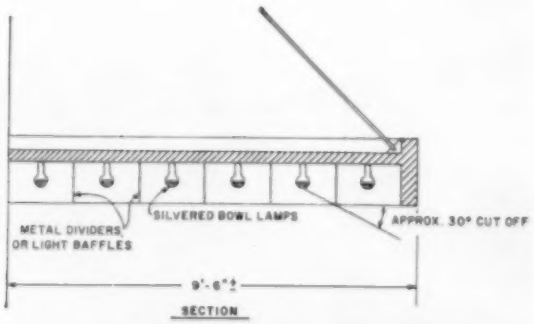


Figure L-3. Study for a marquee lighted by silvered-bowl bulbs shielded by large metal louvers. Metal louvers and ceiling are painted white.

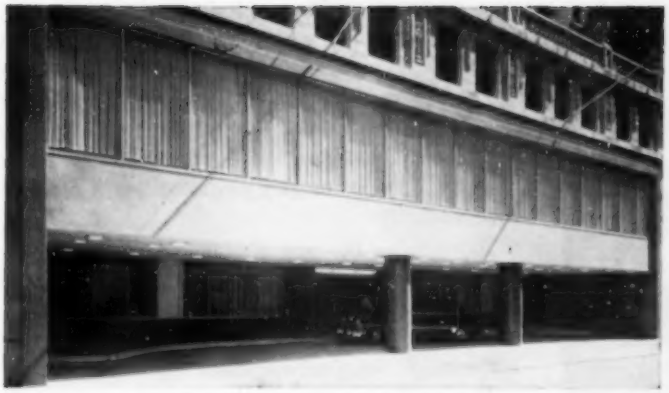


Figure L-4. Recessed incandescent units provide day and night-time lighting for this automobile entrance.

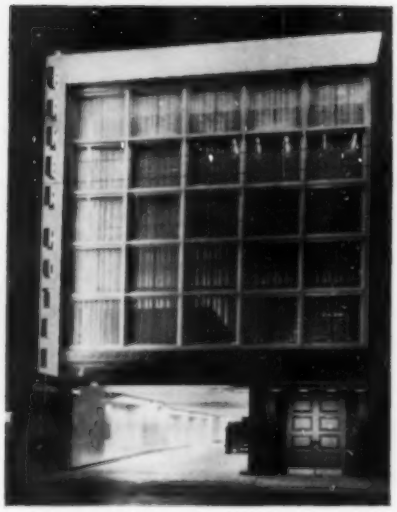


Figure L-5. (right). A red neon sign identifies this city hotel, and fluorescent units provide a lighting level of 30 footcandles in the automobile entrance.

ence in determining the illumination level than any other factor. There are many methods used to light marquees, depending to some degree upon the location and architectural character of the hotel.

The lettering can be done in several ways. Either plastic or glass letters electrically lighted at night and lighted by natural light during the day have proved eminently satisfactory. Cold cathode tube lighting, which is usually installed in a metal channel, is also extensively used for the sign. Another method is to make the letters of some solid metal, such as wrought iron, silhouetted against an illuminated cove behind. This latter system, although attractive, is not always easily legible during either the night or day unless the brightness of the cove is high. One of the better solutions is the solid metal letter placed directly against a continuous frieze of opal glass which is illuminated from behind. Uniformity of brightness is essential because spottiness interferes with visibility. For bright districts the brightness of the background should be 150-350 footlamberts,* for medium-level districts, 120-200, and low-level districts, 90-150. The transilluminated molded plastic letter set in a dark background has good legibility both day and night and is simple to maintain.

The soffit, or underneath part of the marquee, which directs light to the sidewalk and surroundings can be treated in several different ways. Small egg-crate louvers have been used extensively as shielding beneath fluorescent tubes to produce a pleasant "soft" effect. High-output fluorescent lamps are especially useful for greater light output, higher brightness and less variation due to cold weather. Opal glass or plastic panels resting on metal channels is another method which creates a pleasing over-all effect, but may involve high first cost and high maintenance.

Another system utilizes flush lenses or reflector lamps, which is the standard downlight solution. (This system may create undue contrast between the light sources and the soffit.) An inexpensive and very effective system is one which uses silvered bowl bulbs in large metal egg-crates approximately 2 feet 6 inches square and deep enough for a 30-degree cut-off.

The illumination below the marquee will be effective with a level of 30 footcandles for low brightness districts and 50 footcandles for high brightness districts.

For outdoor conditions, it is especially important to provide good maintenance. See Chapter 7.

M. Outdoor

Signs on the top and sides of hotels should be legible and clearly visible. Local competition of all signs in the immediate neighborhood will be a factor in sign design. Neon tubes installed in channels is one of the standard methods of designing outdoor signs today; incandescent bulbs — white, colored or clear — are also used. Another type is the silhouetted letter with tubes or bulbs behind it. A third type is a sign on a flat surface; this may be

*The quantity of light (lumens) emitted or reflected from each square foot of observed surface is measured in *footlamberts*.

Figure M-1. Sign with neon tubing in metal channels. Note also indirect lighting in canopy over gasoline pumps.

Figure M-2. Silhouetted letters with neon tubing behind.

a painted sign or one built of porcelain enamel, floodlighted or with each letter of the sign outlined with a single exposed tube of neon. Still a fourth is a transilluminated sheet of plastic with solid or painted letters on the face of it. Lighted signs which are effective in the daytime are now being made; these signs employ projector lamps for daytime visibility.

Maintaining the sign economically is an important item to be considered. Porcelain enamel is an excellent material for the background, with porcelain enamel or stainless steel for the channels and the trim.

The same types of design outlined above can be used for highway signs. In addition, the painted sign, properly illuminated by floodlights or angle reflectors, is a common method of achieving a good effect at a low cost.

At the entrance of highway hotels standard reflector lamps are sometimes installed on poles to focus light on the ground at strategic locations. These reflectors can also be placed at intervals between the entrance and the office, facing toward the office and illuminating the approach to it. Another type of outdoor lighting of the grounds is the use of a lantern mounted on a post. The roadway leading to the hotel can be turned into a continuous sheet of white light at night through the use of low parapet walls, on either side of the roadway, on the top of which continuous reflectors are installed. With this system the light is directed upon the surface of the road, creating a most dramatic effect as seen from the highway. The hotel structure itself should be brilliantly lighted so it can be seen from a distance by approaching motorists, but light must not enter guest room windows.

Figure M-3. Illuminated signs atop tall hotels are excellent advertising.

Figure M-4. Floodlighted highway hotel attracts motorists.

When fluorescent tubes are enclosed in a glass or plastic unit, they operate more efficiently at the low temperatures encountered out-of-doors. High-output fluorescent tubes are best for this service. Enclosures are not needed in some southern areas.

There is a trend today toward lighting gardens, trees and shrubbery to make landscaping attractive by night as well as by day. Many types of lighting units are available for this purpose; most are designed for incandescent bulbs but fluorescent tubes and mercury vapor floodlamps also find application in decorative outdoor lighting. The blue-green light from mercury vapor floodlamps is especially attractive on green foliage.

Nothing is more effective than good, attractive lighting when one is "selling his product" along the highway at night. It is the old story of the moth and the flame.

Chapter 4 — Light Sources

There are two types of light sources which are of primary interest to the hotel operator — incandescent filament bulbs and fluorescent tubes.

Incandescent Filament Bulbs

Incandescent filament bulbs produce light because of the high temperature of the filament when an electric current is passed through it. At high filament temperatures light output and efficiency are increased at the expense of bulb life. Conversely, at low filament temperature, life is longer but the light output and efficiency are lower. It is a fairly simple matter for manufacturers to design bulbs, which, on the average, will last for a specified number of hours when operated at their labeled voltage. Economic studies indicate that, for the majority of applications, general service bulbs with 750 or 1000 hours life provide light at lowest overall cost to users.

The installation and operation of incandescent bulbs is relatively simple since they may be connected directly to an electrical supply of the proper voltage and they do not require auxiliary control devices as fluorescent tubes do. Most lighting requirements suggest the use of incandescent bulbs in lighting units to control the distribution of light and brightness within an area. Their small, compact size usually permits simple lighting units to be used for this purpose. In addition, their light output can be controlled by simple dimming devices.

Bulb Shapes and Sizes

Common incandescent bulb shapes are shown in Fig. 4-1. For general lighting, the A and PS shapes are most used. Flame-shaped and globe-shaped bulbs are available in 15-, 25-, and 40-watt sizes for ornamental lighting units where the bulbs are exposed and where the bulb shape enhances the artistic design of the lighting unit. Tubular bulbs are of particular value for use in the small inconspicuous reflectors of display cases, in small coves and narrow cavities.

The diameter of a bulb is expressed by a number often used with the letter designating bulb shape. The number indicates the largest diameter in eighths of an inch. For example, A19 is an A-shaped bulb, 19 eighths, or 2⅜ inches in diameter at its largest dimension.

Bulb Finishes

(1) *Inside frosting* is widely applied to many types and sizes of bulbs. It gives moderate diffusion of light with practically no reduction in output. The extremely high filament brightness of

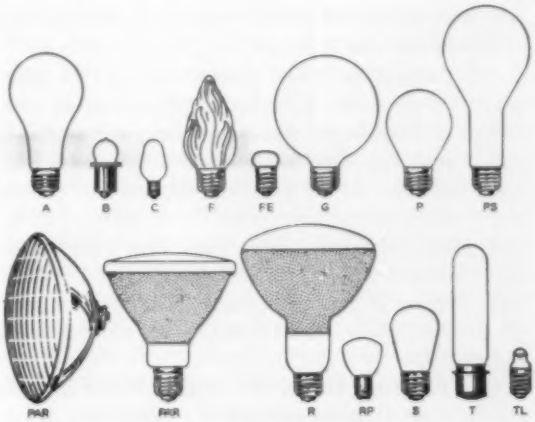


Figure 4-1. Some typical incandescent bulb shapes.

clear bulbs and the sharpness of shadows are reduced by frosting.

(2) *Silica-coated "white" bulbs* provide an even higher degree of diffusion with little loss of light. They also tend to conceal the blackening which appears on inside frosted bulbs after many hours of operation, hence giving better appearance. Some of the popular wattage bulbs are now made with the silica coating.

(3) *Enameled luminous-bowl "GA" bulb* provides good diffusion and control of light. It can be used in many bare bulb sockets, and in some lighting units, to reduce glare and improve lighting quality. The enameled bowl of the bulb has a warm, pleasing tint. Two-thirds of the light is directed upward, and one-third downward. It has been used for improving the lighting of hotel corridors and rosette-type ceiling units in guest rooms. (See Fig. F-17.)

(4) Indirect lighting can be done efficiently with *silvered-bowl* bulbs. Cleaning of lighting units is minimized since the reflecting surfaces which are built onto the bulbs do not collect dirt. Some units for silvered-bowl bulbs are designed with the bowls exposed so that bulb replacement can be managed from the floor with a suction-type changer.

(5) *Daylight bulbs* have blue-green glass and produce light from which some of the red and yellow wavelengths have been absorbed. This color modification is achieved at the expense of about 35 per cent reduction in light output.

Bulbs of Special-Purpose Design

(1) Reflector Bulbs. These self-contained spotlights and floodlights are made in both regular glass for indoor use, and heat-resistant glass for outdoor use. They direct light into concentrated "spot" or broad "flood" beams by means of a mushroom-shaped bulb, an inside silver reflecting surface and by control of the density of the frosting at the end of the bulb.

(2) Colored Reflector. Reflector bulbs with color baked on the bulbs are convenient sources of controlled, colored light. There are many colors available, but six of them, chosen for their balance and compatibility, are of greatest importance. There are two complementary pairs: red, green, yellow and blue; and two tints: pink and blue-white. Complementary pairs produce white light; other combinations can produce many other useful colors. If used outdoors, these must be protected from the weather.

(3) Projector Bulbs. These are similar in construction to all-glass sealed-beam automobile headlamps. They are made of molded heat-resistant glass and may be used outdoors in locations exposed to snow and rain. However, they are often used indoors as their efficiency and control provide more light in "spot" and "flood" beams than reflector bulbs. Projector bulbs are also made in the six colors as listed in (2) above.

(4) Three-Light Bulbs. These bulbs have two filaments which may be operated separately or together to provide three different lighting levels. Their principal use is in portable lamps.

(5) Rough Service and Vibration Bulbs. Incandescent bulbs are sometimes subjected in use to conditions of heavy shock or vibration which general service bulbs are not constructed to withstand. For applications of this type special filament materials and construction designs are employed. Shock-resistant designs differ from those which resist vibration. If it is uncertain which condition exists, the rough service bulb will perform satisfactorily under either.

(6) Lumiline. These are linear incandescent sources with a simple disk base at each end. They may be installed in continuous lines of light.

Color with Incandescent Bulbs

The light produced by the glowing filament of a general service incandescent bulb is orange-white in color and provides a warm-tone effect. Increasing the temperature of the filament (which can be done by increasing the voltage applied to the bulb) makes the light appear to be whiter. Reducing the filament temperature makes the light more yellow or orange in color and substantially lowers the bulb efficiency. However, only a small degree of color control is possible by varying the filament temperature of an incandescent bulb.

A wide range of colors can be provided by a line of sign and decorative incandescent bulbs which have colored ceramic coatings baked permanently on the outside of their glass, just as with the line of colored reflector bulbs. (Color can also be produced by using regular incandescent bulbs with colored glass lenses having suitable attachments.)

Pastel-tinted bulbs in the standard range of wattages and sizes are also made in pink, yellow, green, blue and aqua tints. They enhance certain colors in decorative schemes and permit a change of atmosphere simply and inexpensively.

The colored components of the white filament light which are not wanted are absorbed by the bulb coating or lens, while the desired color is transmitted. Yellow and orange colors can be produced by incandescent bulbs with moderate loss in light output, but a large amount of light is lost in producing green and blue, since the warm filament light is not rich in these cool colored components.

Voltage Characteristics of Incandescent Bulbs

When the voltage applied to incandescent bulbs is varied, there is a resulting change in the filament temperature, the light output, the wattage consumed, the life of the bulb, and the over-all efficiency. These factors are interrelated and a change in one causes changes in the others. Figure 4-2 illustrates this fact. This is of interest in hotel operation as some degree of control may be exercised over the voltage supplied to sockets and over the design voltage of the bulbs provided for the sockets.

Since the only object of burning bulbs is to obtain *light*, it is reasonable to adopt the policy of getting the most light, or most lighting service, from the over-all expenditure. The expenses usually comprise three items: bulb and replacement labor cost, cost of electric power consumed, and fixed charges such as taxes, insurance, and sometimes amortization of investment. So the cost of light is an economic matter and the life, light output, and price of bulbs are influencing factors.

It was mentioned earlier that general service bulbs having design lives of 750 or 1000 hours produce light at lowest cost when operated at their rated voltage. In certain uses, conditions may be encountered which alter the economic picture. For example, if the labor cost of bulb replacement is high because of inaccessible luminaire location or high labor rate, or if the electric power rate is unusually low, bulbs with longer life and reduced efficiency may be economically justified. If it is felt that longer life may be needed in a certain area, a study should be made of the specific conditions which exist to determine just what is the most economical life rating. Longer life may be obtained by installing bulbs of higher labelled voltage than that supplied at the socket (for example, 125-volt bulbs on 120-volt circuits increases life by two-thirds) or by using bulbs designed for perhaps two or three times the life rating of general service type bulbs.

Depreciation of Bulbs During Life

As incandescent bulbs are operated, their tungsten filaments slowly evaporate, resulting in a slight reduction of power consumption and a more obvious loss in light output due to tungsten blackening on the bulb surface. For example, a 200-watt bulb after operating for its average rated life produces about 82 per cent of its initial light output. If it continues to operate past its rated life, its output continues to depreciate while it consumes almost as much electric power as when it was first turned on.

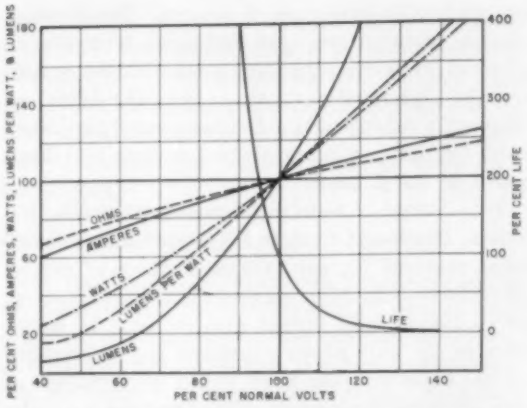


Figure 4-2. Effect of voltage variations on the operating characteristics of incandescent bulbs.

Studies indicate that for maximum economy of light production under typical conditions, general service incandescent bulbs should be replaced at about 70 to 80 per cent of rated life. This is most effectively accomplished under a maintenance procedure known as "group replacement." (See Chapter 7 on Maintenance.)

Dimming of Incandescent Bulbs

It is sometimes desirable to be able to produce several illumination levels in the same room. This flexibility extends the uses of the room, such as permitting slides or motion pictures to be shown in a meeting room (where low level illumination rather than black-out is required for best visual comfort) or allowing the atmosphere in a restaurant to be changed so as to provide a mood suitable for the businessmen's luncheon or the more leisurely dinner and cocktail hours.

Several kinds of light control may be used with incandescent bulbs:

(1) Independent Switching of Groups of Bulbs. This does not require any special controls other than several wiring circuits and switches. It is becoming more convenient with the low-voltage remote control devices made by several manufacturers. It is necessary to predetermine the lighting levels desired with each circuit or combination of circuits, and only specific levels of illumination can be provided. Since the bulbs which are being used are operating at or near rated voltage, switching provides the greatest economy of light production of any of the dimming methods. There is also an opportunity to switch groups of colored bulbs and mix colors for distinctive lighting effects.

(2) Resistance Dimming. Any lighting level from black-out to the maximum can be arrived at

smoothly with this type of control. The rheostat may be motor driven and controlled from remote stations. However, operating costs with this system are the highest of any, since, when the bulbs are dimmed, a substantial part of the energy previously used for lighting is transferred to heat and dissipated in the dimmer.

(3) Variable Autotransformers, Saturable Reactors, Electronic Controls. The specialized equipment required for any of these methods of control provides smooth dimming operation from minimum to maximum light output plus economy in operation as the only power consumed is that supplied to the bulbs plus the small power requirements of the dimming equipment. These systems may also be controlled from remote stations.

Loss of Bulbs

The loss of bulbs by theft may occasionally be a problem in hotels. General accounting controls are sometimes employed to minimize this loss. Other possible solutions are: (1) At extra cost, bulb sockets and bases with left-hand screw threads may be obtained; (2) Lock sockets which use a special key to apply a set-screw to the bulb base when it is installed may be employed; (3) Use of some of the longer fluorescent tubes for lighting may reduce theft since the tubes are harder to conceal. Management will have to weigh the value of items (1) and (2) in terms of the additional cost of the special equipment.

Fluorescent Tubes

Fluorescent tubes are high-efficiency light sources with long life. Their comparatively low brightness and extended length make them well suited for many general lighting and decorative lighting applications. They are different from incandescent bulbs in that they require a ballast to provide sufficient voltage for starting and operating under stable conditions. The ballast also consumes some electric power while the tube is operating, and its wattage should be added to that of the tube or tubes it operates to determine the total lighting load. Even with ballast wattage considered, the efficiency of light production with fluorescent tubes may be two or three times that of incandescent bulbs.

Fluorescent tubes generally are divided into two classes — hot cathode and cold cathode.

Hot Cathode Fluorescent Tubes

Hot cathode fluorescent tubes have a filament cathode at each end of the tube. (Cathodes are elements which receive or emit the electric current that flows through the tube during operation.) Tubes made with hot cathodes are more efficient producers of light than cold cathode tubes (discussed later) and may be operated at higher current, giving higher light output per length of tube. There are several types of hot cathode tubes in common use.

(1) *Preheat-Start.* These are the oldest type tubes. They use a starting device to preheat the cathodes before they start to operate. They are made in many wattages and lengths — from 4 to 100 watts and from 6 to 60 inches in length.

Development of trigger-start ballasts which give nearly instantaneous starting for 14-, 15-, and 20-watt tubes has eliminated the need for starters if trigger-start is specified in purchasing lighting units. Although the method of operation shortens tube life by about one-quarter, the convenience of nearly instant-starting and the relatively long life of fluorescent tubes make it attractive.

(2) *Rapid-Start.* These are the newest type tube and may be operated without starters. The cathodes are burned continuously and the tubes start almost instantly after the switch is turned on. The elimination of starters from the circuit simplifies maintenance and provides light at no higher cost than the older preheat start types. Rapid-start tubes are made in lengths from 24 to 96 inches, and in 8-, 12-, and 16-inch diameter circular shape. See Dimming and Flashing Tubes. (Page 393.)

(3) *Slimline.* These tubes start instantly when the circuit voltage is applied. They are made in lengths from 42 to 96 inches and ¾ to 1½ inches in diameter. There are ballasts available for operating these tubes at various current ratings. Increasing the current increases the tube brightness and light output.

Cold Cathode Fluorescent Tubes

Cold cathode fluorescent tubes have a cylindrical form cathode at each end. These cathodes operate at temperatures lower than those of hot cathode tubes. Cold cathode tubes are noted for their long life and may be flashed repeatedly without adversely affecting their life, making them useful in electrical advertising. While they are not suited to as high current operation as hot cathode types, and operate at a somewhat lower efficiency, they may be dimmed by reducing the voltage applied to the circuit. Cold cathode tubing bent into custom shapes is widely used in special lighting applications.

Fluorescent Tube Designations

Rapid-start and preheat-start fluorescent tubes are usually identified by their nominal wattage rating and tube diameter. For example, a particular fluorescent tube may be designated by this ab-

breviation: F40T12/RS/CW. This is interpreted to mean a fluorescent tube of 40 watts, in a tubular bulb $^{12}/_{8}$ of an inch ($1\frac{1}{2}$ inches) in diameter, of the rapid-start design in the cool white color. If it were a preheat-start rather than rapid-start tube, the RS would be omitted.

Slimline tubes are usually designated by their over-all length (including sockets) and the tube diameter. For example an F96T12/CW means a fluorescent tube 96 inches long in a tubular bulb $^{12}/_{8}$ of an inch in diameter in the cool white color.

Circular tubes are specified in terms of their over-all diameter and tube diameter. An FC12T10/WW means a fluorescent circular tube 12 inches in over-all diameter in a tubular bulb $^{10}/_{8}$ of an inch (or $1\frac{1}{4}$ inches) in diameter in the warm white color.

Fluorescent Tube Colors

The development of fluorescent tubes has greatly expanded the possibilities for using colored light. Tube colors may be obtained by the selection of the phosphor or proportions of phosphors which coat the inside of the tube. There is no filtering or absorption of light, except in the case of red and gold fluorescent tubes, and efficiencies are far higher than with incandescent bulbs. Pink, green, blue, gold and red are the popular saturated colors in which fluorescent tubes are made.

The ease with which tube colors may be produced had also led to the great variety of "tints" of white in the fluorescent tubes commercially available. This has created some confusion among users as to how to choose the right color of tube for a particular application. This problem can usually be solved by answering two questions:

(1) Is a warm or cool atmosphere desired in the area to be lighted?

(2) Is best color rendition with reasonable tube efficiency or high tube efficiency with satisfactory color rendering preferred?

Warm white tubes produce a warm, intimate effect which is associated with the use of flame and incandescent sources. Cool white tubes produce a clear, crisp, modern effect associated with natural daylight. There are areas in most hotels where one atmosphere or the other may be preferred. For example: the warm atmosphere might be most desirable in guest rooms and dining areas; a cool one might be more appropriate in offices and lobbies, particularly if there is exposure to daylight. Fluorescent tubes marked "Daylight" are rather blue and are not satisfactory for other than strictly utilitarian areas; this was the first fluorescent color manufactured but it is very little used today. In addition to the regular warm and cool white fluorescent tubes, there are also newer types, both warm and cool, which offer a greatly improved color rendition, especially for red colors. This better color rendition is obtained with some loss in light output. Color-improved tubes enhance the colors in fabrics, as well as those in foods and complexions.

Dimming and Flashing Tubes

The development of rapid-start fluorescent tubes has made possible the development of reliable and economical dimming systems for this type of source. An electronic circuit has been developed which controls the brightness over a wide range. Still another "simplified" circuit permits dimming with a variable autotransformer of a size appropriate for the number of tubes in the system. A special ballast is required for each lamp being operated on the dimming circuit. Dimmers which vary the light output in a series of steps are also available.

The color and efficiency of fluorescent tubes operated at reduced output are not appreciably affected as is the case with incandescent bulbs. Dimming may be a desirable feature in the lighting of hotel ballrooms, dining areas, cocktail lounges, lobbies, parlors, etc.

Bulb and Tube Economics

Brief explanations have been given as to how incandescent and fluorescent sources operate. It is important to maintain the circuit voltage near its nominal rated value to insure good performance. Reduced circuit voltage lengthens the life of incandescent bulbs but causes a disproportionate loss in illumination, efficiency and over-all economy. Low voltage retards fluorescent tube starting and can shorten life. High voltage increases light output but appreciably shortens the life of incandescent bulbs and can cause tube and ballast difficulties with fluorescent systems. Of the two, fluorescent lighting is less susceptible to voltage variation but, for economy and reliable operation, proper circuit voltage should be maintained at the sockets with either type.

Light source quality is an important factor in producing light but its full effect on lighting economics is seldom recognized. Bulb or tube cost is usually a few per cent of the total expenditure for light. Acceptance of reduced performance may be motivated by the promise of reduced cost but the result is likely to be an increase. Sacrificing a few per cent in source efficiency reduces the effectiveness of the total lighting installation, whereas the saving is on only a small part of lighting cost; the source performance affects the total investment, and the unit cost of light may be increased.

OTHER SOURCES

Mercury. Mercury bulbs or tubes are used in many outdoor applications such as parking lots, driveways, floodlighting of buildings and landscape lighting. Mercury sources give a characteristic blue-green illumination but in recent developments, phosphors, which produce other colors, have been added to the bulb to give good color for both interior and exterior use.

Oven. Incandescent bulbs used for illumination inside of ovens must be specially designed. Special precautions are taken to select the materials from which the bulbs are made and to use manufacturing processes which will enable the bulbs to withstand the high temperatures.

Glow. Low wattage and long-life characteristics of glow sources make them appropriate sources for signals and indicators such as in wall plate switches and fire cabinets.

Infrared. The radiant energy produced by these sources is converted into heat through absorption by the objects which are heated or dried. No warm-up or cool-off periods are required. They are made in reflector-type bulbs and in globe-shaped or tubular bulbs which require separate reflectors. They are used for drying paints, cooking or warming foods, evaporating moisture, and heat therapy at a guest's request.

Sunlamp. Artificial sources of "sunshine" ultraviolet can be offered to guests for their personal use or built into popular solaria. Sun lounges are particularly popular in seasonal resort hotels, for maintaining registration volume all year.

Projection. Great strides have been made in the quality of still and movie projection equipment and in the bulbs that are used in them. The bulb types and wattages required for efficient operation of projection equipment should be provided where hotels make this equipment available for use.

Chapter 5 — Quality of Light

The purpose of lighting is to provide efficient and comfortable seeing. Poor lighting installations are easily recognized as glaring and uncomfortable or even hazardous. However, lighting which is not immediately distasteful may over a period of time result in discomfort. A lighting installation should produce the following: (1) adequate light (see Table I), (2) an aesthetic feeling in harmony with the lighted space, (3) avoidance of reflections in glossy surfaces, (4) avoidance of a high degree of variation of brightness in the field of view, (5) avoidance of dense shadows, (6) economy of light usage without impairment of the general over-all function, and (7) control of light.

Lighting equipment which is too bright for the environment in which it is located produces glare. One example of glare is that produced by automobile headlights after dark. The annoyance caused to the eye is not basically due to the intensity of the light coming from the automobile headlight, but rather to the difference in intensity between the headlight and its background; the same light during a bright sunshiny day is hardly noticeable. When one tries to read under a single light over a bed (such as a bullet light where the book is illuminated but the rest of the room is dark) the amount of light on the book may be adequate but the contrast between it and the dark room is extremely annoying.

Direct glare from a light source may be reduced by:

(1) decreasing the brightness of the lighting equipment (using larger sources rather than very concentrated ones),

(2) diminishing the area of high brightness (but this often cuts down the total amount of light also),

(3) moving the light sources away from the line of sight.

(4) brightening the surroundings against which the light source is seen.

Sometimes an image of the light source is reflected toward the eyes from a shiny surface. Such reflections can be distracting and uncomfortable and can reduce the ability to see. The use of glass tops on dressers, tables and desks in guest rooms immediately causes this type of objectionable situation. Highly polished metals may produce the same effect. The hotel operator should consider carefully the effect of furniture surface finishes on lighting. Room finishes should be non-glossy wherever practical. In kitchen areas with stainless steel, the lighting units should be so located that the image of the light source is reflected away from the workers' eyes for normal operations.

Shadows, when sharply defined, are annoying too. In guest rooms and work areas the lighting should not produce shadows for positions of normal occupancy. Shadows are softened if light comes to a point from many directions; that is, if there are several light sources. Light-colored non-glossy room surfaces reflect diffused light back into the room, helping to soften shadows as well as greatly increasing the utilization of light. Ceilings, especially, should be white or very light in color in guest rooms, rest rooms and work areas. (Carrying the ceiling paint part way down the wall increases the amount of light.) Dark dados in public rooms may be visually uncomfortable and soak up considerable light. Light-colored flooring also in-

creases the amount of useful light in a room and decreases annoying extreme differences in brightness between light sources and room surfaces.

Chapter 6 — Color in Lighting

The "color effect" produced in a room may be the result of several causes. The color of the light source, the colors of the walls, pictures, draperies, rugs and furniture may all combine to produce a dominant color feeling. There are simple rules for obtaining desired effects by the combined use of light sources, wall colors, and room decorations.

Colors are popularly spoken of as cool, warm or neutral. Though engineers and physicists regard such psychological effects as beyond their realm, the hotel owner or manager who caters to public taste should recognize the "popular" reactions to color.

The physicist regards light as radiant energy of specified wavelengths. As we see colors in the rainbow, the shortest wavelength is violet, and the longest wavelength is red. Generally speaking, the short wavelengths — blue, blue-green, green and yellowish-green produce a "cool" impression. The longer wavelengths — yellow-orange, orange and red produce a warm impression. These are psychological effects, and thus, whatever their cause, they are important.

Cool effects are generally produced by "tints." A tint is obtained by adding white to a "hue" or specific color. Thus blue mixed with white will produce tints commonly referred to as "light blue," "baby blue," and so forth. Red mixed with white will produce tints of pink, "shell pink," and so forth. Pink is regarded as cooler than red, though still warm in effect because its basic color is red.

Standard incandescent bulbs give a warm quality of light even though they may be designated "white." If a decidedly warm color is needed to enhance the human complexion, "pink" bulbs may be used. Warmer colors may also be obtained by the use of yellow, gold and amber bulbs in bars and cocktail lounges. Such colors of light, however, distort the true colors of draperies, rugs, pictures and furniture, giving them a "warmer" appearance and emphasizing the browns, oranges and reds in the decorative scheme.

Certain fluorescent tubes produce a quality of light approaching that of incandescent bulbs and are designated as warm white. The improved-color type produces better color rendition than the ordinary or standard tubes because the radiation is augmented in red. These are especially applicable where it is desirable to accent reddish colors and flesh tones.

For working spaces such as laundries, furnace rooms and garage facilities, high luminous efficiency of the source is perhaps of greatest importance so long as the color of the source does not depart too far from what may be considered in general a white source, and where fine color discrimination is not important. In these conditions the colors of ordinary incandescent bulbs and of any of the so-called "white" fluorescent tubes may be considered satisfactory. Mercury sources, because of their high luminous efficiency, may be used for certain environments where the greenish-blue light of these lamps is not too objectionable. Improved-color mercury sources are often economical in these areas.

A mixture of incandescent bulbs and fluorescent tubes is not objectionable if a warm color fluorescent is selected. The over-all atmosphere of warmth which will result is generally desirable for environments such as those for social activity. But if an atmosphere approaching the effect of daylight is desired, a "cool" white fluorescent tube should be selected. Here also the "cool" white with augmented red light will produce better color rendition but at the expense of some loss in light output.

Colors of interior finishes and furnishings should be chosen under the light source color with which they will be used.

The color effect of a lighted environment is important from the observer's viewpoint in regard to the satisfaction the observer feels from his experience as to the fidelity of color rendition and as to the suitability of the color atmosphere as well, being important for the emotional tone established in the observer by the color mode. Appetizing color of food is an important factor in dining and requires special attention to the color of light sources for these areas. So, in the hotel lighting, as in any other type of lighting, color is a very important consideration.

Chapter 7 — Maintenance

Maintenance of a lighting system is the effort which is expended to keep the system operating as near to its original state as is economically feasible. The objective is to maintain the illumination at the level which was originally the objective for a given area and for which the owner is paying.

Research has indicated that, in production-type industries, money spent for proper maintenance brings a favorable return as a result of fewer mistakes and more rapid performance. There are many phases of hotel operation where this principle can be applied directly — in preparation of food, washing and inspection of glasses and dishes, valet shop cleaning, and the many accounting transactions, to mention a few. In addition, the hotel benefits from a better and brighter appearance. Proper planning

and the following of a definite schedule can also reduce over-all maintenance costs.

The hotel manager is also vitally concerned with giving service to his guests, and the lighting system in the public and guest areas is designed and installed with this in mind. Bulb age and accumulated dirt may decrease illumination by as much as 50 per cent, giving dim lighting which might easily discourage guests. If many of the marquee bulbs are out, as a result of poor maintenance, the tourist family may decide to drive on to the next town in search of a "nicer" hotel. The hotel management is concerned not only with providing ample illumination for definite tasks but also with creating a favorable appearance. This requirement increases the importance of proper maintenance and suggests that maintenance expenditures will bring profitable returns in all parts of the building.

General lighting maintenance can be reduced to three simple functions: bulb replacement, cleaning, and general electrical maintenance, with special emphasis on portable lamps and their wiring.

Bulb Replacement

The manager's objective with regard to replacing bulbs is to do so when the bulb is no longer doing its job, with a minimum of cost and a minimum of inconvenience to the guest. Burnouts should be replaced as soon as possible to maintain good appearance and proper illumination. Every member of the staff can report burnouts if encouraged to do so, particularly in the corridors and public areas. Maids should check portable lamps and ceiling units in guest rooms as a routine part of room servicing. The night watchman can be helpful in checking corridors and stairways.

The cost of replacing bulbs depends on the wage scale of the person performing the labor and the time consumed to make the change, which includes travel time to and from the place of the burnout. In some cases, the interruption of profitable enterprise or the inconveniencing of guests may also be a factor influencing costs, though difficult to measure. If maids change the bulbs in guest rooms, replacement costs may be less than if an electrician or maintenance man is required. The use of lighting units which are easily accessible for replacing bulbs will also reduce the time and expense of replacement. Burnouts should be reported with a certain minimum detail. For example, if a guest room ceiling lamp is out, a ladder will be required and the ceiling location should be reported. A list of bulb specifications for various lighting units and locations may prove a practical aid for maintenance men and in particular new employees.

Lighting unit design and installation may exert a considerable influence on the maintenance problem. For example, if the number of times a hotel corridor unit has bulb replacements and cleanings in twenty years is considered, it is seen that ease of bulb replacement and cleaning are as important considerations in lighting unit selection and installation as appearance and intial costs. The easiest way to achieve low lighting maintenance cost is to design the system and select the lighting units with these considerations in mind.

Regardless of the expected life of a light source, it will burn out some time, and there will be a dark spot in a corridor or lobby, or elsewhere until it can be replaced. A procedure which minimizes such outages and simplifies maintenance work is known as group replacement. This is the practice of changing all the bulbs in a particular installation at the same time, after they have burned for about 70-80 per cent of their rated lives. This plan is particularly advantageous for corridors, public spaces and some back-of-the-house areas where the burning hours are easily estimated. As an example, if 60-watt bulbs having a normal life of 1000 hours are being burned continuously in corridors, at five volts below rating, a group replacement plan would call for a complete renewal about every ten weeks. During the six weeks following this renewal, there would probably be not over one per cent of outages. In lighting units that are difficult to reach, or where the operation is continuous or regular, the saving in labor is well worth the sacrifice of one-fourth of the value of the bulbs. The advantages are summarized as follows:

(a) Since a group of bulbs placed in service at the same time begin to fail more rapidly after about 70 per cent of their life, most of the bulbs can be replaced at one time after they have served the greater part of their useful life, but before they burn out individually. Perhaps no more than 10 or 20 per cent of the installations will have to be replaced by the usual one-at-a-time method.

(b) The work of replacing bulbs, when done systematically, avoids many trips for ladders and bulbs, as well as telephone calls and delays incident to the ordinary spot replacement procedure. The economy in labor often exceeds the additional outlay for bulbs.

(c) As bulbs near the end of their life they become blackened and produce less light. Removal of these from service results in a higher average illumination level from the same number of bulbs.

(d) Group replacing can be done at a time when it will cause the least inconvenience to guests, or interruption of service functions.

This group replacement of bulbs has the same

advantages in both fluorescent and incandescent installations. Since it is possible to estimate from the degree of end blackness the likelihood of a fluorescent tube having many hours of life left, many who follow a group plan have the best-looking tubes removed and use them for interim replacement. Sometimes a number equal to perhaps 20 per cent of the entire installation is thus laid aside; the time when they are all used up as interim replacements serves as a signal that time for the next group replacing has arrived.

Lighting unit cleaning schedules are usually timed to coincide with group replacing schedules. This results in additional labor savings. With the "production-line" replacement methods employed in bulb replacing, it often becomes economical to acquire special equipment such as portable scaffolds and wash tanks, which also improve the efficiency of group replacing and cleaning. In addition, some of the stand-by service personnel can be employed for this operation, effecting another economy.

Replacing bulbs in public spaces sometimes presents special problems, particularly where the bulbs are hard to get at. Lighting units should be easily accessible, either by ladder or special maintenance equipment such as telescoping scaffolds, or the units should be on hangers for disconnecting and lowering. Occasionally bulbs can be replaced from catwalks above the ceiling, depending on the building structure.

Blinking fluorescent tubes which cannot be changed during the day because of crowded conditions can be annoying to guests, call attention to the poor maintenance, and, perhaps, be damaging to the tube ballast. Under these circumstances consideration should be given to tubes and accessories which do not result in an annoying blink when tubes have reached the end of life.

There are a great many mechanical aids that can simplify the problem of bulb replacing. These include lamp-changing poles and lamp tote boxes. In many cases ladders and bulb carriers can be combined with a shoulder strap for greater convenience. The cost of lamp replacement is the major factor in maintenance cost. Every effort should be made to reduce it. Some large hotels have "bulb boys" who devote all of their time to this work. In other buildings, electricians, general maintenance men, housemen, or even maids may perform this function. Oftentimes a concentrated study for a short time will indicate just what the average "cost of replacement" is for a given building. In some hotels, elevator delays comprise a substantial portion of this cost; in others an analysis of inventory control may prove enlightening.

As hotel wage rates climb the "cost of replacement" will become an even more serious expense. The possibility of using long life lamps or purchasing lamps with a higher rated voltage than the system voltage was mentioned in Chapter 4. Substantial maintenance savings may often be realized by these considerations. However, an accurate analysis of these possibilities is quite complex. As life is increased at lower voltage, light output is decreased; the cost of electrical energy per unit of light produced may increase substantially; bulbs will cost more. The pertinent factors in such an analysis differ so substantially from one hotel to another that generalizations are impossible. Attention is called to this possible avenue towards cost reduction, and the hotel manager is encouraged to seek expert advice as to the relation of these possibilities to his specific circumstances.

Cleaning

Lighting costs the hotel money. If the illumination is reduced 50 per cent because of dirt collection on bulbs and lighting units, which is not uncommon, the hotel is only getting fifty cents worth of light for its lighting dollar. A relatively small expenditure for cleaning will usually recover much of this loss.

The cleaning phase of lighting maintenance includes the cleaning of walls, ceilings, and other surfaces as well as the cleaning of bulbs and lighting units, since light is absorbed by dirt wherever it is. Light-colored surfaces particularly need cleaning regularly to be efficient in reflecting the light that strikes them. General maintenance procedures such as the proper selection of air filtering systems, will minimize this phase of lighting costs.

The gradual reduction in illumination because of dirt and dust accumulation is difficult to detect without the use of a light meter. Usually the lighting level is measured when the lighting system is first installed. Cleaning is then done when the lighting level has dropped to a predetermined point. On the basis of this method, a cleaning schedule can be set up as a routine part of lighting maintenance. This cleaning schedule will vary depending on the location, type of lighting unit, and amount of dirt in the area.

Lighting units should be chosen which are so constructed that the light-directing surfaces can be easily cleaned in place or removed for cleaning on the floor. If the cleaning is done on the floor, a portable wash tank for washing louvers and reflectors is desirable for efficiency, particularly where there are a large number of units to be cleaned. Other devices for easier and faster cleaning include ladders, portable scaffolding, and disconnecting hangers. Portable blowers or attachments for

vacuum cleaners can be used to blow or pull the dust out of many overhead lighting units. This is not a substitute for washing but will serve to reduce the number of complete cleanings necessary. Manufacturers of lighting units using plastic recommend the use of de-staticizers to reduce the dust-attracting tendencies of the plastic after it has been cleaned.

Most important is a complete cleaning and inspection schedule that is followed through. The principles of good housekeeping indicate special emphasis on the cleaning phase of lighting maintenance for best lighting results.

If the hotel is not staffed to accomplish this routine cleaning, the services of a maintenance company should be considered. These companies can provide a regular cleaning and bulb replacing service and in many cases have reduced maintenance costs for their customers. Normally they have specialized equipment and trained personnel who can do lighting unit cleaning efficiently.

Electrical Maintenance

One of the big problems in hotels is that of inspection as part of preventive maintenance. Floor, desk and table lamps, as well as wall and ceiling outlets, may be used for years without authoritative inspection if, for example, maids or unskilled personnel perform the only maintenance required in the interim, that of changing burned-out bulbs. Sockets may become loose, plugs insecure, or insulation worn through. If unskilled personnel replace burnouts, periodic inspection of portable lamps and other electrical equipment should be performed by skilled electricians to insure proper functioning of equipment and safety.

An important part of maintenance factor is the use of standard lighting unit types, particularly in those parts of the hotel where they may not change too often, such as guest room baths. Since replacement parts may be required many years after the units are purchased, it is wise to buy established brands from reputable dealers who can supply these parts later on.

Lighting units, and in particular recessed ceiling units, should be carefully selected so that bulb replacement operations will not soil or otherwise damage adjacent finishes. Hotel painters should be instructed not to paint ceiling rings until they have been loosened on those fixtures which require ring removal to change bulbs. Often these rings are "painted in" and paint is pulled from the ceiling when the rings are removed.

The following suggestions are made in the interest of minimizing the cost of electrical maintenance, which is usually a large one compared to bulb replacement and cleaning:

(1) Avoid extension cords, particularly where the beds are moved when made up. Relocate the outlet if necessary.

(2) Specify table and desk lamps with the switch on the base rather than on the socket.

(3) Instruct painters not to paint over the convenience outlets and adjusting screws on lighting units.

(4) Arrange circuits in such manner that failure of one circuit does not leave an entire area without light.

(5) Fuse circuits to prevent overloading of the wiring.

(6) Label circuits clearly at distribution panels.

(7) Bolt large heavy table lamps in public spaces to the tables.

(8) Do not compromise with the quality of the electrical parts of the lighting units or of the bulbs (tubes).

(9) Insist on periodic inspection of all lighting equipment.

Appendix — Cost of Operating Existing Installations

Lighting economy may be defined as maintaining a desired illumination level for the least amount of money.

The factors involved in the cost of operating an *existing lighting installation* involve:

(a) the cost of the bulb,
(b) the wattage of the bulb and accessories,
(c) the cost of electrical energy,
(d) the life of the bulb in hours,
(e) the cost of replacing the bulb.

Calculating the total operating cost (less amortization, taxes and insurance and based on individual bulb replacements) can be done as follows:

$$C_t = A \times C_1 + A \times C_m + B$$

where

C_t = the total cost in dollars of operating an existing lighting unit per year

A = number of bulbs (tubes) to be replaced per year per lighting unit $= \dfrac{\text{total hours of use per year}}{\text{bulb life in hours}} \times$ number of bulbs per lighting unit

C_1 = cost of each bulb in dollars

C_m = cost of replacing each bulb in dollars

B = total cost of electricity per year per unit = hours of use per year $\times \dfrac{\left(\begin{array}{c}\text{bulb wattage} \times \text{number of bulbs per lighting unit} + \text{total ballast wattage (if fluorescent)}\end{array}\right)}{1000} \times$ the energy rate (¢/khr)

Example: For a lighting unit containing one 100-watt incandescent bulb operated four hours every day, assume $C_1 = \$0.16$, $C_m = \$0.50$ and energy rate $= \$0.03$/kwhr.

$$C_t = \left(\frac{4 \times 365}{750} \times 1 \times \$.16\right) + \left(\frac{4 \times 365}{750} \times 1 \times \$.50\right)$$

$$+ \left(4 \times 365 \times \frac{100 \times 1 + 0}{1000} \times \$.03\right)$$

$$= \$.31 + \$.98 + \$4.38 = \$5.67 \text{ per year.}$$

The operating cost as calculated above is only useful in determining how much a particular existing lighting installation costs to operate on a yearly basis. It cannot be used for comparing the merits of lighting installations using different lighting units.

To make such a comparison additional factors must be taken into consideration; the quantity of light provided by each, the quality of light produced by each, and the appearance of each. However, the amount of light provided by each is the only factor that can be easily and actually applied for comparison purposes.

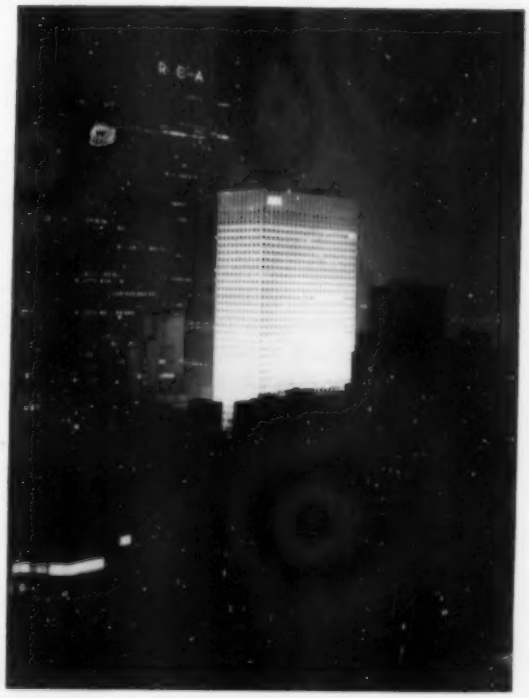
It can be done as follows: for example, in comparing the operating costs of two ceiling lighting systems, both of which provide good quality of light in two identical rooms, A using 10 X units and B using 10 Y units, it is found that the operating costs are the same for both — say $3.00 per year per unit, or $30.00 per year. In measuring the maintained illumination levels in both rooms it is found that room A has 15 footcandles and room B has 20 footcandles. Therefore, using the illumination level as a common denominator for comparison we find:

$$\text{for room A} \quad \frac{\$30.00}{15} = \$2.00 \text{ per year per footcandle}$$

$$\text{for room B} \quad \frac{\$30.00}{20} = \$1.50 \text{ per year per footcandle}$$

This shows that for equal light the Y units in room B are more economical.

As it has been stated previously in Chapter 4 under Fluorescent Tubes, the efficiency of light production with fluorescent tubes may be two or three times that of incandescent bulbs. For example, two 40-watt fluorescent cool white tubes (a total of approximately 100 watts including the ballast) provide 5000 lumens, whereas one 100-watt incandescent inside frosted bulb provides 1630 lumens. It can be seen from this that to provide the same amount of light the wattage of a fluorescent system will be less than an incandescent system. This means that for a given number of circuits of a certain wire size, more light can be provided by a fluorescent system. This is of particularly pertinent value in the remodeling of old hotels where it is desired to raise the illumination level without the necessary rewiring for additional circuits.



LATEST floodlighting installation in New York City's skyline is the Tishman Tower, at 666 Fifth Ave. The top 29 floors of the building are floodlighted to levels of from 5 to 10 footcandles by a total of 72 specially designed R-80 lamps. The 1000-watt improved-color mercury vapor lamps are 10 inches across the face. The highly-polished aluminum all-weather conical reflectors are three feet long and 26 inches across their open faces. Beam length varies from 30 to 360 feet, to cover the 64,448-square foot areas of north and south walls and the 33,480-square foot areas of the east and west walls. Three banks of lamps are located on the 10th floor setback and three more banks on the 15th floor setback.

Lights are switched on and off by an automatic timer, set according to the season of the year. The tower will be lighted an average of six hours every night. Lamp life is 4000 hours. Total candlepower is 9,720,000.

Photo and data courtesy of Lighting by Feder, New York, N. Y.

Thought for Food

An effective coffee shop—Norm's in Los Angeles. Here, to the usual features of acoustics, air-conditioning and attractive design, has been added a lighting system planned especially for attractiveness and comfort. Several elements achieve this: Downlights for relatively high levels (21 footcandles) on the quick service counter; lower levels (17 footcandles) on the tables and booths suggest a more leisurely pace. Contrasting brightnesses have been held low in all areas. Photo courtesy of Jack Russell, Department of Water and Power, City of Los Angeles.

A novel, and rather interesting system has been used for this company employee's lounge. It uses silver-bowl and PAR-38 lamps on regular patterns, colored R-40's, colored sign lamps and, in two-foot square boxes, deluxe cool and warm fluorescent lamps. The ceiling units are shielded with fine mesh aluminum "honey-comb" panels. Photo courtesy of General Electric Co., Lamp Dept., Cleveland, Ohio.

A dimly-lit bistro may have its charm, but elegance of decor — of which lighting is a part — is ever associated with spacious dining. For large hotel dining rooms and well-known restaurants, attractive lighting design and pleasing atmosphere have come to be as much expected as a good chef. The installations pictured on these pages have been designed to achieve this atmosphere.

As contrasted to coffee shops and other quick service areas, restaurants such as De Salvo's in Cudahy, Wis., aim to suggest leisurely dining. Recessed spot luminaires highlight the napery, while "atmosphere" is supplied by dimmer controlled suspended fixtures using 60-watt pink lamps. Lighting levels are deliberately kept low, varying (with dimmer) from 5 to 15 footcandles. Photo courtesy of Richard Garber, Wisconsin Electric Power Co., Milwaukee, Wis.

Colored light has been used in this drive-in restaurant to attract the young-in-heart. In the irregularly shaped luminous element, pink, white and green fluorescent lamps are independently switched for varying the panel color. A row of recessed fluorescent lamps around the perimeter highlights the draperies and window booths for night-time attractiveness. Photo courtesy of General Electric Co., Lamp Dept., Cleveland, Ohio.

Showmanship and cooking in full view build food sales at Robb's Restaurant, Los Angeles. The architectural design has been coordinated with a system of pierced incandescent luminaires; every alternate unit supplying light upward to the sloping acoustical ceiling as well as downward to the counter. Levels on the order of 80 footcandles in the background kitchen area, contrasted with lower levels on the counter, highlight the cooking area. Photo courtesy of Jack Russell, Department of Water and Power, Los Angeles.

Infrared installations not only dramatize luscious roasts, but keep them piping hot as well. This unit is located in the serving line of a cafeteria, and consists of a simple bank of heat lamps mounted in a canopy over the carving area. Photo courtesy of *Food Service* magazine, Madison, Wis.

Cocktail lounges require "light touches" rather than high levels. Several of these add charm to this room: Light filtering through perforations in the bar front; small downlights in the canopy over the bar; a row of concealed lights at the foot of the bar. The decorative chandeliers and wall-mounted luminaires add an interesting pattern of brightness. Low-level general lighting is reflected from the ceiling — from above the canopy. The system is on dimmer control so that the lighting can be varied for different atmospheres. Photo courtesy of General Electric Co., Lamp Dept., Cleveland, Ohio.

No unusual "tricks" have been used in this dining room. The lighting system has been planned with an eye to good lighting principles, while at the same time enhancing the colonial decor of the room. Although this picture was taken during daylight hours, nighttime illumination has a pleasant, comfortable quality, abetted by the "perimeter" sources, wall brackets and table lamps. The Colonial chandeliers are about five feet in diameter, each using 12 standard incandescent lamps with white translucent shades. Lighting level averages 10 to 15 footcandles. Photo courtesy of L. J. Riegert, B. M. D. & R., Inc., Minneapolis, Minn.

In this long narrow area (45 feet by 16 feet), structural beauty has been achieved by the lighting design; comfort and a pleasing atmosphere achieved by the application of principles of brightness, color rendition and illumination levels. In this remodeled shop the apparent ceiling had been lowered with the use of suspended or floating beams. For the lighting systems, these beams have been used as totally indirect "fixtures." After making the entire room one big reflector by using light colors throughout, twelve 4-lamp, 4-foot and four 4-lamp, 2-foot fluorescent strip fixtures were inverted and installed on the top of the beams. The beams were mounted at eight feet, two feet below the ten-foot ceiling, and are two feet wide with a one-foot space between. This permits the light to be reflected off the white ceiling, down through the one-foot openings, the luminaires and lamps remaining invisible. For added sparkle on the silverware and to provide good color rendition for food, eleven 150-watt R-40 incandescent floods with concentric ring louvers were ceiling recessed between the beams along the counter line.

Two different "appetite atmospheres" have been created without one distracting from the other. This was accomplished by shielding the counter

Booth and counter areas.

(quick sales area) from the booths (more relaxed dining). A vertical panel from beam to ceiling, on the beam between the counter and booth area, provides a visual division. Six 4-lamp, 4-foot rapid start strip fixtures with dimmer controls provide an atmosphere division. In the intermediate area and above the service soda fountain, one ceiling-recessed R-40 flood with concentric ring louver and one 4-lamp, 4-foot recessed troffer with Albalite lens maintain the average illumination level of 50 footcandles for the counter.

Cooking area.

In the exposed kitchen area, it was necessary to design adequate lighting which would not distract from the quiet atmosphere of the booths. Additional false beams with ceiling-height side panels accommodate eight 300-watt wide-area incandescent low brightness louvered fixtures recessed in the beams. Three 150-watt R-40 louvered fixtures recessed in the ceiling between the four beams direct additional light down into deep steam kettles in back of the counter.

The system is maintained by cleaning the fixtures once a week, and since the area is lighted 24 hours a day, the manager is keeping close track of lamp operating hours, group relamping at 80 per cent of expected life.

The installation was designed by J. H. Shirley, Southern California Edison Co., Los Angeles, for Eaton's Restaurant in Compton, Calif., and was an entry in the 1957 MMILJ competition of the Southern California Section of I.E.S.

A successful coffee shop in Atlanta, Ga. combines strategically-placed downlighting with decorative coves for a suggestion of quick service with pleasantness. Indirect silver-bowl dome in the center further relieves the over-all system of downlighting. Photo courtesy of Jack H. Murrah, Georgia Power Co., Atlanta, Ga.

"House of the Future"

and how it is lighted

By JAN REYNOLDS

FUNDAMENTAL objective of this project, which was opened to the public at Disneyland, Calif., last June, is to develop and improve the understanding and acceptance of new materials, designs and techniques for the construction industry — particularly as related to housing.

The house was built by the Monsanto Chemical Co., from plans developed by Hamilton & Goody, Architects, Boston, and is part of the plastics-in-building research project sponsored by the plastics manufacturer at the Massachusetts Institute of Technology. The final product is the result of the most advanced thinking of several designers and engineers, as well as the combined and co-ordinated technical efforts of twelve cooperating companies.

Today, the house represents something beyond what the average person dreams of as an ideal home, because there has never before been anything like it. The first impression can be startling, but further inspection shows how the many elements have been woven together, designed for more convenient, pleasanter living. At this time Monsanto does not plan to make or sell the "House of the Future." However, it may be a fore-runner of the home which will be in demand some day.

The structure is made primarily of reinforced plastics which are a combination of polyester resins and fibrous glass. Laminated wood, safety glass, rigid foam plastics, special adhesives, Neoprene, steel and other traditional materials are also used where their characteristics will best serve.

Each of the four 16- by 16-foot cantilevered rooms is formed by four 8- by 16-foot plastic sections molded in compound curves. Interlocking joints, using standard bolting methods and adhesives, fasten the sections together to form a rigid structure which will support many times the weight to which it would normally be subjected.

The rooms extend out from a 16-foot square utility core in a cruciform design which provides, in a small floor area, a maximum of privacy and quiet. In production, individual taste could be served by combining molded sections to form a variety of floor plans. Sections can also be added or removed as family size changes.

Inside, also, the house has unusual design features. The ceiling and one wall of each room have a pleasing curve. There is an abundance of glass wall area of heat-absorbing, laminated, ceramic, tinted Thermopane, with further shielding from daytime brightness by draperies of a new plastic fabric of acrylon fiber.

AUTHOR: Residential Lighting and Color Consultant, Sylvania Electric Products Inc., New York, N. Y. Factual data compiled by Don Caverly, formerly of Sylvania.

The house is insulated with rigid foam plastic built into the major components, making it easy to cool and heat. It is filter air-conditioned through a climate control center located in the kitchen. Extremely strong and highly resistant to corrosion and wear, it will not rot or burn and is, of course, termite-proof. Colors can be applied either as paint on the surface or permanently built-in to the material itself.

Wiring System

To carry out the fundamental idea of completely prefabricated wings, assembled and joined to the center core at the site, it was necessary to plan for pre-wiring. Each wing, when joined to the center core, would be connected to it in a relatively simple and fast operation. Since the Disneyland house required exploratory work, this was not actually done, but the system is so designed that it can be, when and if such houses reach the production stage.

Each wing consists of four large curved plastic sections, called "bents," which are joined at the building site. All wiring was put in the bottom halves only, except for the dining room section. For flexibility, one branch circuit was run in each bent and connected to three duplex receptacles recessed in the floor, and one at the center of the rear curved wall. Each circuit is protected by a circuit breaker, plus a fuse in the neutral. All eight of the lower-half bents are similarly wired, the only difference beings "lefts" and "rights." All lighting for the wings is plugged into outlets, and can be moved or changed for different decoration schemes. Incandescent equipment is operated through dimming controls also plugged into the outlets. No wall switches are used in the wings.

Floor receptacle boxes were especially made extra deep with 2-inch collars around the top and small spring closing doors similar to the larger stage pockets. This permits the use of standard cord plugs under rugs and at floor level, without bulges or plug caps visible. The cords pass through small holes which form when the cover doors close.

Kitchen

Kelvinator's "family food center" occupies over half the center utility core, and is designed deliberately not to look like a kitchen. Consistent with the open house plan of the future, it is open on the side to the family room, in a wing, and blends with this area in color and design.

Lighting requirements in the kitchen were high levels without high brightnesses. It was also desirable to provide a way to reduce contrast between the 150 footcandles in the kitchen and the comparatively low levels in the dining area.

Kitchen.

A luminous ceiling of a sheet plastic material with layers of fine glass flake embedded in it is suspended, in 2- by 2-foot panels, on a grid of translucent plastic inverted T-bars. About 6 inches above, continuous single rows of fluorescent lamps are installed 6 inches apart. The polarizing material prevents streaks of light, which might be expected with lamps this close to the ceiling panels. It has suitable diffusing characteristics in addition to radial polarization, and no appreciable sag or color change is expected, since the product is about 90 per cent glass.

All fluorescent lamp ballasts used are designed to permit dimming from peak brilliance to black-out. Thus, when the housewife needs an abundance of light, she has only to touch a button. And when dinner is served, the kitchen ceiling can be dimmed to comfortable levels.

Additional light at counter tops and other work surfaces is supplied by localized strip systems under the overhead cabinets.

Since the total lighting load for the kitchen and the adult bath is about 3½ kw, dimming equipment for the two areas is motorized, and located in the basement with remote raise-lower switches at the control centers. Control center for the kitchen is built into the side of the specially designed dish-washing, drying and storage unit. This unit is an "island" in the center of the kitchen and employs high-frequency sound waves, which set up vibrations in the wash water powerful enough to remove all sticky food particles. It also dries the dishes and stores them. A control button brings the dishes up on top of the unit for next use. A disposal device takes care of waste. Plumbing and elec-

trical connections are through the pipe supports, extending from ceiling to floor.

Refrigerator and freezer compartments are located in the wall cabinets above the counters, moving down to eye level at the touch of a switch. Both are divided into front and rear sections which may be raised or lowered independently, so it is never necessary to reach far into a shelf.

An electronic range, which cooks with microwaves, is concealed beneath the counter top, rising electrically when needed, to bring the oven to a more convenient access level. A special metal-coated transparent glass door panel keeps the cooking heat inside, while allowing full view of the food.

Family Room

The family room contains the dining area, a second area for general conversation, television and lounging, and a third grouping of desk, chair and a communication control center. This third area is where home planning is done for meals and household bills; school data and other records are kept here. It is the office of the home.

Both entrances to the house are in this room. At one entrance, a wall storage unit, for outdoor clothing, serves also as a screen to separate the planning area from the rest of the room. The closet in this unit is equipped with forced heated air ventilation to dry damp clothing and keep it fresh. An enclosed section at the top contains four small 75-watt spot lights, whose light shines through four oval slots in the side of the cabinet to accent a display of glassware on a shelf at the end of the room.

The focal point in the family room is the dining table, and the lighting here is designed to make meal-times pleasant. The ceiling-hung fixture used is shaped like a straight-sided hour-glass, and is of spun brass sprayed with a white matte finish. Tiny perforations add sparkle and interest. A 150-watt PAR-38 is used in the lower half of this unit, and a 200-watt R-40 in the upper part to provide indirect component for general room illumination. Each lamp is separately dimmer controlled for different combinations of upward and downward light. Shielding is by concentric ring louvering. This fixture is the only one in the wing rooms which is wired directly from an outlet in the ceiling.

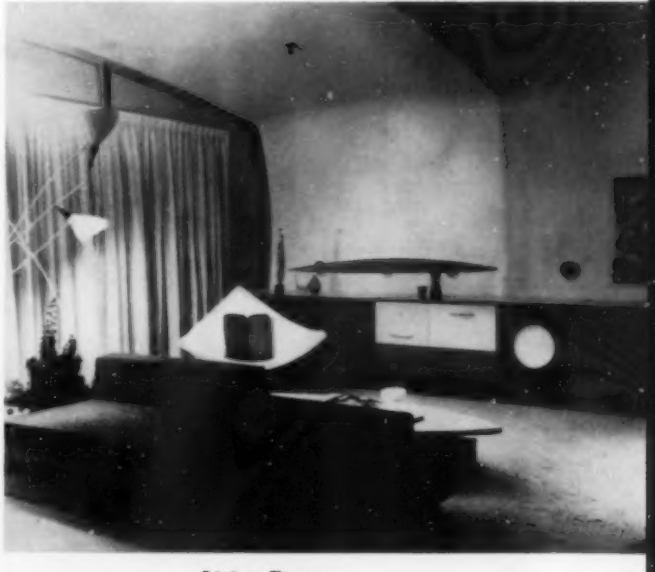
For the lounge area around the TV set, no special lighting equipment was deemed necessary. There is general indirect light from the dining table unit for casual conversation. This can, of course, be dimmed for television viewing. An illuminated glass cabinet, which displays china and glassware, is primarily decorative in character, providing a touch of light in this section of the room.

At the planning center desk, an adjustable desk lamp has a deep metal shade, so that it can be used for desk work without distracting those in other parts of the room.

Living Room

More formal than the family room, the living room is for entertaining as well as general use. It has two major lighting elements. The first is a shallow plastic dome, four feet in diameter, suspended from the ceiling on a fine wire thread. This is lighted from below by means of a specially designed and built floor projector. The dome, which seems to be floating in air, can be raised or lowered to any desired height, or moved from place to place around the room. The projector, using a 250-watt R-40 lamp, is also portable and is placed on the floor directly beneath the dome. The projector is plugged into a receptacle provided for it and operates on dimmer control. An iris adjusts the size of the beam to suit the height of the dome. Concentric ring louvers shield the lamp from normal viewing angles, and tinted color roundels may be used for parties or special occasions.

The second element is a pole lamp — a thin telescopic rod which extends from floor to ceiling and is held in position by pressure against floor and ceiling. Four slender graceful curved rods attached to the pole end in specially formed reflectors using 100-watt lamps. The rods are adjustable in any direction up or down, and the reflectors swivel in place. Lamps are individually switched and are on dimmer control, for added flexibility. This unit can



Living Room.

be placed anywhere in the room, since it plugs into the nearest floor outlet with its own dimmers.

A third element, a small portable table lamp, is placed upon a small end table, and is used for reading or other casual visual work. When dimmed, it serves as a decorative note.

Master Bedroom and Baths

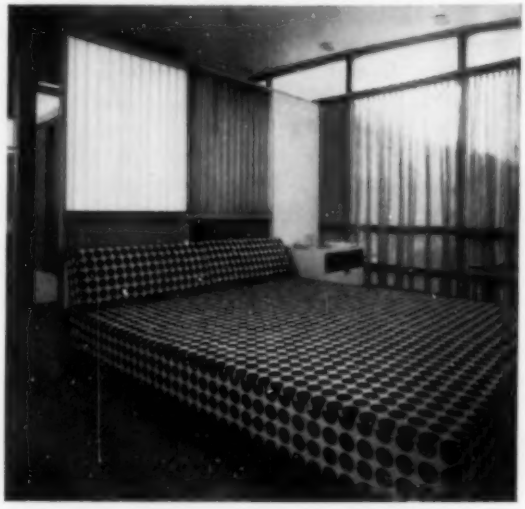
Lighting requirements in the master bedroom are for the bed and the vanity. Bed lighting is by a luminous headboard, with vertical louvers divided in the middle so that one side can be adjusted one way and the other side in a different way. This allows one person to read with plenty of light, directed away from the other occupant. The 6- by 4-foot luminous plastic panel behind the louvers is illuminated by six 40-watt fluorescent lamps. These are arranged vertically, three on each side, with each group of three separately controlled by a dimmer located just above the pillow at each side of the bed, within easy reach.

When louvers are fully opened and the lamps undimmed, the headboard unit provides adequate general room illumination without any other lighting fixtures. A small boudoir lamp is used on a table by a chair, but is primarily decorative in function.

The vanity, placed at the inside wall of the bedroom, is a unit area by itself, since it is separated from the rest of the room by the bed headboard, the back of which is a wall-storage type closet. The vanity's long counter top, of laminated melamine plastic, is slightly concave at the front edge. A lavatory is recessed at the right end and a large vertical mirror provides facilities for grooming.

Well above the counter top but still within easy reach, a long horizontal cabinet with the same contour as the counter provides storage space for cosmetics, perfume bottles and accessories. The unit is luminous and furnishes all the light needed for the vanity. A specially designed light trough is recessed in the under side of the cabinet and contains three 96-inch slimline lamps, running parallel. At each end is a 100-watt clear incandescent lamp. Diffusion and shielding are by plastic panels under the fluorescent lamps and glass lenses below the incandescent. The center fluorescent lamp is deluxe warm white in color and the two outside are daylight. These are switched separately by three knobs in the counter top for variety in color for make-up.

This lighting trough also provides upward light



Illuminated headboard in Master Bedroom.

Illuminated vanity in Master Bedroom, and adult Bathroom.

into the cabinet which, with glass shelves and frosted glass panelled sliding doors, becomes a luminous decorative element. It is particularly attractive when colored bottles are placed on the shelves with light shining through them.

The bathrooms, which are located in the central core, were designed by Henry Dreyfuss, and represent the joint efforts of the plastics and plumbing industries. Shower enclosures, water closets, lavatories and bathtubs are all molded as integral parts of the wall. The usual faucets and other fittings have been replaced with electric or automatic controls. Hot and cold water, are turned on and off by push-button, and temperature control is automatic.

In the children's bath, the plumbing fixtures are adjustable in height and can be positioned automatically at the push of another button. This solves the problem of too-high fixtures.

Lighting in both rooms is similar. Round and oval luminous domes, which appear to be part of the plastic ceiling contour, are illuminated by fluorescent lamps above them. Dimmer knobs at the bathroom control center adjust the lighting level for daytime use or for night, when a normal amount of light can be almost blinding to sleep-filled eyes.

Mirrors above the lavatory are lighted separately with concealed fluorescent lamps on each side. For night lighting, an electroluminescent plaque is left "on" all the time. It is curved to match the wall curvature and is mounted out about an inch from the wall on a small pedestal. When left on as a night light, it supplies enough light for dark-adapted eyes to see almost anything.

Children's Wing

The third wing belongs to the children, a boy and a girl. It can be a single large playroom in and daytime, and two private bedrooms at night. A room separator of vinyl panels unfolds out from the end wall forming a partition.

In the boy's room, general decorative lighting is provided by a series of parchment globes, one over another from floor to ceiling, each containing a 40-watt lamp. Over-all effect is that of a string of Japanese lanterns. The globes were designed by Isamu Noguchi and adapted for the "House of the Future." A similar but smaller lamp by Noguchi is placed on the floor of the girl's room. Lighting nearer the floor is needed by children, who sit on the floor or on low stools to read and play.

For study, a desk-bench, built to fit the curved end walls of each room, has all the drawers and writing surfaces needed for homework, and on the girl's side a small vanity arrangement which folds down out of sight.

Children's Room.

Lighting fixtures over these are special plastic, boat-shaped units with six 13-watt T5 lamps. Each is suspended from the ceiling by two fine threads. Ballasts are located behind the desk and connected to the fixture by a multi-wire cord which passes out the back and down the wall.

Exterior Lighting

Entrances to the house are lighted in a more or less conventional manner, with louvered incandescent downlights recessed through slab-type canopies. Concealed spot and floodlights highlight the landscaping of a brook, concrete walks and shrubberies.

One exterior lighting device which adds to the interior lighting is the highlighting of the window wall in the family room, which is covered with translucent plastic fiber draperies. A 150-watt PAR-38 reflector flood is installed under the steps of one entrance adjusted toward the window. This lamp is housed in a protective shield, and concentric ring louvers prevent unwanted spill light. This floodlighting from outdoors turns the drapes into a luminous wall, with cheerful pleasing effect.

Communications

In keeping with its other aspects, the "House of the Future" has a most up-to-date communications system. Phones have push buttons instead of dials; there are viewing screens and room-to-room intercoms. The 13 units of telephone equipment in the house have microphones, instead of handsets, which pick up a voice from anywhere in the room.

Lighting Is First Step In Dance Hall Design

FACTORS influencing the lighting of Roseland, New York City's famous dance hall, were psychological as well as physical. The vast ballroom — 250 feet by 100 feet in area with 60-foot ceiling height — had to be brought down to a more human scale. The people who frequent Roseland are not jitterbuggers or of the rock 'n roll set, but rather a more sedate type, mainly married couples, who delight in dancing. They are gregarious enough to want to be with many other people, but they also want the aloneness that intimate surroundings can give. They want glamor, but not at the sacrifice of dignity.

In creating the exact environment desired, the lighting was considered first; the background was then specified against which the light was to be used. Large chandeliers, two of which are 30 feet in diameter supply both direct and indirect light over the dance floor area. Lamps used are in three colors and can be dimmed either individually or together. For a cha-cha, the floor can be bathed in bright hot colors, and low levels of deep blues and purples can supplement the dreamy nature of waltzes or slow fox trots.

The decorative treatment against which the lighting is thrown consists of canopies, made of strips of material in two colors, draped from the ceiling out to the edges of the balcony. This gives an illusion of a lower ceiling without interfering with the efficiency of the existing ceiling-installed air-conditioning system. The canopies are motorized and can be raised or lowered for most effective combination of space and lighting.

The bandstand is a focal point with a concentration of light from colored borders, footlights, spots and other stage lighting equipment. Around the periphery of the room, banquettes conceal continuous rows of colored fluorescent lamps, which are constantly changing in color.

All this lighting is controlled from a booth directly behind the bandstand, so the operator can take his lighting cues from the orchestra leader in following the mood of the music.

The dance floor is surrounded by a plastic and wrought iron railing, along which garden lamps are spaced. These are sometimes used alone with a few "stars" overhead to give the feeling of an out-of-doors dance area.

This installation was a "Most Interesting" one for Arthur L. Finn, of Finn and Jenter, New York City, and was his entry in the New York Section's 1958 contest.

CONSTITUTION

Of The Illuminating Engineering Society

The 1958 revision of the I.E.S. Constitution as approved by the membership in the 1958 ballot. By-laws are in a separate printing.

ARTICLE I

Name and Objects

Section 1: The name of this association shall be the Illuminating Engineering Society.

Section 2: Its object shall be the advancement of the theory and practice of illuminating engineering and the dissemination of knowledge relating thereto. Among the means to this end shall be meetings for the presentation and discussion of appropriate papers; the publication as may seem expedient of such papers, of discussions and communications; and through committees, the study of subjects relating to the science and art of illumination and the publication of reports thereon.

ARTICLE II

Membership

Section 1: The individual members of this Society shall be designated as MEMBERS, Associate Members, Student Members, Fellows, MEMBERS Emeritus, Fellows Emeritus, Honorary Members and retired Members. There may also be Sustaining Members.

Section 2: A MEMBER shall be not less than twenty-six years of age and shall have been for at least eight years actively engaged in a professional or other responsible capacity in the practice or teaching of illumination or in other fields or activities directly related thereto, or shall have attained an equivalent standing by having made some valuable contribution to the science or art of illuminating engineering or to the literature pertaining thereto. Graduation from a school of engineering of accepted standing or equal technical or scientific education shall be considered equivalent to three years of active practice.

Section 3: An Associate Member may be anyone interested in the objects of the Society. At the time of his election he shall not be less than eighteen years of age.

Section 4: A Student Member shall be one registered in a College or University for study toward a degree in an engineering, science, fine arts or other related curriculum acceptable to the Council. A Student Member may have the privilege of partipating in meetings, but shall not have the right to vote or to hold elective office except in a Student Branch.

Section 5: A Fellow shall be not less than thirty-two years of age and shall have been in good standing in the grade of Member for a period of at least three years preceding election to the grade of Fellow. He shall have been for at least ten years an illuminating engineer by profession or a teacher of illuminating engineering in an engineering school of accepted standing and in responsible charge of such professional or teaching activity for a period of at least five years, or shall have attained an equivalent standing by notable original work, scientific attainment or invention in the field of illuminating engineering or in scientific fields directly related thereto. A Fellow shall have made some valuable contribution to the technical activities of the Society and to the science or art of illumination, or to the scientific fields directly related thereto. He shall be a graduate of an engineering school of accepted standing or shall have equivalent technical or scientific education.

Section 6: A MEMBER Emeritus or Fellow Emeritus shall be respectively a MEMBER or Fellow who has retired from regular occupation in business or profession, after having performed for the Society services of such meritorious character as the Council may deem worthy of this honorable reward.

A MEMBER Emeritus or Fellow Emeritus, respectively, shall have the same privileges as a MEMBER or Fellow.

Section 7: Honorary Members may be chosen from among those who are of acknowledged eminence in some branch of art or science related to illuminating engineering. Honorary Members shall be entitled to all the privileges of the Society except the right to vote and to hold elective office therein.

Section 8: A Retired member shall be or have been an individual member who has retired from regular occupation in business or profession, who has been in good standing for a period of thirty (30) years and who is not less than sixty-five (65) years of age. Retired members shall be entitled to all privileges of the Society except the right to hold elective office.

Section 9: A Sustaining Member may be a company, firm, association, or individual interested in the objects of the Society and desirous of contributing to its support. A Sustaining Member may name an individual as its Official Representative to the Society. An Official Representative shall not have the right to vote or to hold elective office in the Society unless he himself is a MEMBER, Associate Member or Fellow of the Society.

ARTICLE III

Admission and Removal of Members

Section 1: Admission to membership in the Society and transfer between grades of membership shall be in ac-

cordance with procedures adopted by a vote of the Council and stated in the By-laws.

Section 2: Removal from membership in the Society may be by voluntary resignation, by action of Council for delinquency in the payment of dues, by action of Council upon written request of ten or more members, or by death. Removal shall be in accordance with procedures adopted by a vote of the Council and stated in the By-laws.

ARTICLE IV

Dues

Section 1: An entrance fee, payable on admission to the Society, may be fixed by the Council as may also a transfer fee, payable on transfer between grades of membership.

Section 2: The annual dues for members shall be according to the following schedule:

MEMBERS and Fellows	$18.00 U.S.A.
Associate Members	
During first three years	13.50 U.S.A.
After three full years in this grade dues shall be increased October 1st to	16.00 U.S.A.
After six full years in the grade dues shall be increased October 1st to	18.00 U.S.A.
Student Members and Retired members	5.00 U.S.A.

The annual dues for all grades of individual membership held by persons residing outside of the U.S.A., its possessions, and Canada, shall be 50% of the foregoing amounts.

Section 3: MEMBERS Emeritus, Fellows Emeritus and Honorary Members shall be exempt from the payment of annual dues.

Section 4: Annual dues for Sustaining Members shall be elective, with a minimum as established by Council and stated in the By-laws.

ARTICLE V

Officers, Directors and Regional Vice-Presidents

Section 1: The officers of the Society shall be a President, a first Vice-President, a second Vice-President, a General Secretary and a Treasurer. There shall be six Directors. There shall be one Regional Vice-President resident in and representing each of the duly established Regions of the Society. Only MEMBERS, Fellows, MEMBERS Emeritus and Fellows Emeritus are eligible to serve as officers, Directors, or Regional Vice-Presidents of the Society.

Section 2: The President, the General Secretary and the Treasurer shall hold office for one year; the Vice-Presidents shall hold office for two years, one retiring each year; the Directors shall hold office for three years, two retiring each year; the Regional Vice-Presidents shall hold office for two years, approximately half retiring each year.

The terms of office of the officers, Directors, and Regional Vice-Presidents shall commence on the first day of October.

A retiring President or first and second Vice-President shall, for one year, be ineligible for re-election to the same office.

ARTICLE VI

Election of Officers, Directors and Regional Vice-Presidents

Section 1: Each year, a Board of Nomination consisting of the three most recent Past Presidents available and a representative of each Region of the Society, shall proceed to prepare a nomination slate of those who are deemed best suited to serve as officers and Directors in positions to be filled at the ensuing election. The Board shall submit a report to the General Secretary not later than March 15th.

With the Regional Vice-President acting as Chairman, each Regional Nominating Committee shall consist of the Chairmen and Secretaries of all Sections and the Chairmen of all Chapters within the Region. Each Regional Nominating Committee shall select and instruct the Region's representative to the Board of Nomination as to the candidates to be proposed and their qualifications.

Section 2: A ballot bearing the nominations for officers and Directors shall be forwarded by the General Secretary to each voting member not later than April 5th. The members residing in Regions where Regional Vice-Presidents are to be elected shall receive, in addition, ballots bearing the nominations for the respective Regions. Ballots to be counted must reach the General Secretary not later than May 26th.

Section 3: A member may vote for the nominees above provided for or he may substitute names of his own selection.

Section 4: Not later than May 1st, the President shall appoint, subject to the approval of the Council, five members, not members of the Council, to constitute a Committee of Tellers. This Committee shall meet between May 25th and May 30th, and shall receive all ballots from the General Secretary and, shall forthwith proceed, in secret, to count the valid votes. The Committee shall then prepare and sign a report of the results of the vote, which shall be delivered to the General Secretary for presentation to the Council. The General Secretary shall arrange for prompt publication of the results in the designated official publication.

ARTICLE VII

Management

Section 1: The affairs of the Society shall be managed by a Council under this Constitution and the adopted By-laws.

The Council shall consist of the President, the first and second Vice-Presidents, the General Secretary, the Treasurer, the two most recent Past Presidents, the six Directors, and the Regional Vice-Presidents.

In the event of a vacancy in the office of President, the first Vice-President shall succeed to the Presidency. Other vacancies in the Council shall be filled by a vote of the Council.

Such succession to office or appointment by the Council shall not affect the eligibility for election to the same office.

No member of Council shall receive, directly or indirectly, any salary, compensation or emolument from the Society, either as such officer or in any other capacity, unless authorized by a vote of the two-thirds majority of the elected members of Council and the two Past Presidents. No member of Council shall have any financial interest in any contract relating to the operations conducted by the Society, nor in any contract for furnishing supplies thereto, unless by the unanimous vote of the elected members of Council and the two Past Presidents.

By a vote of the Council, it may delegate to an Executive Committee, any of its powers not reserved to the Council. The Executive Committee shall include the officers of the Society. The Executive Committee shall conduct the affairs of the Society between Council meetings.

Section 2: The President shall have general supervision of the affairs of the Society under the direction of the Council. He shall preside at the meetings of the Council.

The President shall be a member ex-officio of all committees with the exception of the Board of Fellows, the Board of Nomination and the Medal Award Committee.

The President shall deliver a report at the National Technical Conference or at the Society's Annual Meeting.

Section 3: The President not later than December 15th following his election shall appoint, subject to approval by a vote of the Council, the following Standing Committees and Boards: The Executive Committee; a Committee on Finance, of at least three members; a Committee on Papers, of at least five members; a Committee on Publications, of at least three members; a General Board of Examiners; and a Board of Fellows, of six Fellows. The members of the Executive Committee, Committee on Finance, the General Board of Examiners, the Papers Committee and the Committee on Publications shall be of Fellow or MEMBER grade.

The President may also appoint, subject to the approval of the Council, technical committees to report on scientific and engineering subjects, general committees and special task committees. Chairmen of technical and general committees shall be of Fellow or MEMBER grade.

All committees shall be directly responsible to the Council and shall act under its direction. The Council may at any time, at its own discretion, remove, by a vote of the Council, any or or all members of a committee. In the case of a Standing Committee, the President shall thereupon appoint others as hereinbefore provided; if the President shall fail duly to appoint such a Committee, the Council may, by a vote of the Council, make the appointment. The terms of the members of all committees shall terminate at the time of the first Council meeting of the new administrative year. In case any new Standing Committee or Board is not appointed by the President and approved by the Council the retiring Committee or Board shall be so advised by the General Secretary and this Committee or Board shall continue to act until its successor is appointed.

Section 4: The first Vice-President shall be responsible for such duties as assigned by the President. In the absence of the President, the first Vice-President shall preside at meetings of the Council and Council Executive Committee.

The second Vice-President shall be responsible for such duties as assigned by the President. In the absence of the President and the first Vice-President, the second Vice-President shall preside at meetings of the Council and Council Executive Committee.

Section 5: A quorum at a meeting of the Council shall consist of a majority of the members of Council including proxies, provided that the number of elected members present exceeds the number of proxies. The "vote of the Council" at a meeting shall be a vote of the majority of those present and which majority vote shall include at least one-quarter of the elected members of the Council. No proxy or member of the Council shall have more than one vote.

Section 6: The General Secretary shall function under the direction of the President and the Council. He shall serve as Secretary of the Council and shall be responsible for official communications.

The General Secretary shall be in general charge of the headquarters offices of the Society and of staff personnel. He shall be responsible for the coordination of the staff efforts with the several officers, committees and programs of the Society.

The General Secretary shall collect all moneys due the Society and deposit same in Society's bank accounts.

According to procedures approved by a vote of the Council, the General Secretary and the Treasurer jointly may assign one or more headquarters staff members to assist them in the handling of Society funds. The General Secretary may assign one or more headquarters staff members to assist him in any of his other responsibilities.

Section 7: The Treasurer shall function under the direction of the President and the Council. He shall be responsible for the liquid assets of the Society.

The Treasurer and the General Secretary jointly shall be responsible for all use of Society funds.

Section 8: The administrative and fiscal year of the Society shall extend from the beginning of October 1st through September 30th of the following year.

Section 9: Matters which are not covered by the Constitution or its By-laws shall be considered by the Council, for appropriate action.

ARTICLE VIII

Meetings

Section 1: The annual Corporate Meeting of the Society shall be held each year in conjunction with the National Technical Conference or at a time and place designated by the Council in keeping with the corporate laws of the State of New York. At this Meeting, a report of the proceedings of the Society for the fiscal year shall be presented by the officers. This report shall be verified by a vote of the Council. Notice of the Annual Meeting of the Society shall be given by the General Secretary to the membership at least 30 days in advance of the Meeting in the designated official publication of the Society.

Section 2: A National Technical Conference shall be held at least once annually on a date and at a place approved by a vote of the Council, for the presentation and discussion of technical papers and reports and of matters affecting the interests of the Society.

Section 3: Meetings of the Society as a body, other than the meetings listed in Sections 1 and 2 of this Article may be held at such times and places as the Council shall direct by a vote of the Council. Notice of all such meetings shall be given by the General Secretary to all members at least thirty days in advance of a meeting.

ARTICLE IX

Regions, Sections, Chapters

Section 1: The Regions of the Society shall be the territorial divisions of the Society with boundaries and constituent Sections and Chapters as adopted by a vote of the Council.

Section 2: The establishment of a Chapter in any area may be authorized by a vote of the Council where the membership is at least twenty (20) voting members. The transfer of a Chapter to Section status may be authorized by a vote of the Council where

the membership is at least fifty (50) voting members. The further requirements for the establishment and procedures for the operation of Chapters and Sections shall be as adopted by a vote of the Council and stated in the By-laws.

Should the membership of a Chapter fall below 20 or that of a Section fall below 50, or should the average attendance at meetings not warrant the maintaining of the organization, the Council may revoke, by a vote of the Council, the Charter of a Chapter or Section.

ARTICLE X

Amendments and By-laws

Section 1: A proposal to amend this Constitution may be made by at least 50 members, in writing to the General Secretary, or by a vote of the Council or by a duly appointed committee charged with the preparation of amendment proposals. All proposals shall be referred to the foregoing committee. The final report of this committee which has been approved by a vote of the Council shall reach the General Secretary not later than February 15th, and shall be by him submitted to the members of the Council for letter ballot. If two-thirds of the Council vote in favor of the proposals, the General Secretary shall submit them to the membership for letter ballot.

Letter ballots on proposals to amend the Constitution shall accompany the ballots sent to the members for the annual election of officers. Votes to be considered shall be received not later than May 26th, and shall be referred to the Committee of Tellers who shall count the valid votes and make a report, which shall be presented to the Council and announced by publication in the designated official publication. An affirmative vote of two-thirds of the entire vote cast by qualified members of the Society shall be necessary to secure the adoption of an amendment. Unless otherwise provided in the proposal, an amendment shall take effect October 1st following its adoption.

Section 2: By-laws in interpretation of the spirit and letter of this Constitution and for its execution may be adopted by a majority vote of the entire Council. Votes on By-laws shall be by letter ballot. Each By-law proposed or adopted shall state the article and section or article of the Constitution to which it relates.

MAIN KITCHEN area of the Baltimore Country Club is approximately 44 by 67 feet, with a hip type ceiling construction. Height from floor to the flat ceiling area is 10 feet. Wall surfaces are broken by nine dormer windows. Colors and reflectances are: ceiling, plaster painted high reflectance metallic white, 85% RF; walls and columns, medium gray, 55% RF; floor, dark red quarry tile, 10% RF; kitchen equipment, satin finish stainless steel, 60% RF.

After 400 hours operation, general illumination of 90 footcandles was supplied by the 41 three-lamp recessed troffers, in continuous rows spaced on 8½-foot centers. Low brightness lenses provide shielding for the unit. Forty-watt T12 standard cool white lamps with rapid-start ballasts are used.

Brightness readings are as follows: 45 degrees toward ceiling from eye level, 140 fL; walls, horizontal, 50 fL; floor, horizontal, 8 fL.

Lighting designed by Nevin S. Weiss and Charles A. Parker, Whitman, Requardt and Associates, Baltimore, Md. Lighting data submitted by Henry A. Naylor of the same company. General contractor, Travelstead Construction Co.; electrical contractor, H. E. Crook & Co.; both of Baltimore.

LIGHTING NEWS

Fourth Annual

I.E.S. Maritime Convention

In reporting on the annual meeting held in IES's eastern-most area — New Brunswick, Nova Scotia and Prince Edward Island — the term "Convention" is no exaggeration. For four years now, two-day meetings of tremendous proportion, technically and socially, have been held there, sponsored alternately by the area's two I.E.S. Chapters, Bluenose (in Halifax) and Maritime (in St. John). This year's meeting was held June 6-7, at the Fort Cumberland Hotel, Amherst, N. S., Maritime Chapter the host. Many old pros at successful conferences could well look into this group's activities.

Their convention program, format and organization is totally home-grown. The region's geography has tended to isolate the two groups from more official Regional Conference activities, and an interesting example of local Society solidarity has developed. It might be said that everybody, but everybody, in both Chapters, knows one another very well. And their wives are all good friends. While this is one phase of I.E.S. at its best, there is another important outcome of their meetings — an annual presentation of lighting information which "disseminates knowledge and furthers the art" in the finest tradition of I.E.S. The Maritime's annual meeting has unquestionably strengthened not only I.E.S. in this area, but the lighting industry as well.

Membership roster for both Bluenose and Maritime Chapters together totals 89. Attendance at their convention was 115. This is an attendance of approximately 130 per cent of total membership. Few, if any Regional Conferences can make this claim!

It is interesting to note that in developing a convention program "on their own," which would meet the members' professional needs, the program pattern is quite similar to the regional conferences held throughout all other I.E.S. areas, i.e., high-calibre out-of-town experts on lighting subjects of very current interest. Examples —

Summary of Blackwell researches on quantity of illumination, by J. Carl Wilson, Canadian Regional Veep. Developments in School Lighting, by Darell B. Harmon. Church Lighting Techniques, by Ed Rambusch. Plastics Characteristics, home lighting developments, street trees plus lighting. What's new in mercury lighting, panel discussions and open forums, luminous ceiling developments. And a totally local MMILJ contest.

With national President Kirk M. Reid present, as well as the Canadian Regional V-P, J. Carl Wilson, the local activities meeting held at 8 a.m., Saturday, took on a new dimension. Maritime Chairman Doug MacMackin presided; twelve men were present, representing this and next year's administrations of both Chapters. Highlights: Prospects of a new Chapter in Moncton; a report on Canadian Region membership in general, Maritime in particular, by Joe Thomas, past Veep. Programs coordinated between the two Chapters, with extension meetings in Moncton, Sidney and, hopefully, Prince Edward Island. Halifax to be host to the 1960 Canadian Regional Conference. Plans already underway by Conference Chairman Henry Lushington. Date, June 6-7, 1960; place, Lord Nelson Hotel, Halifax. (Note to other Canadians: you shouldn't miss this, for anything. Ed.)

Socially

The intimate, one-big-happy-family atmosphere which characterizes the Maritime group naturally makes for a whale of a social program. When the technical sessions end, it takes over, totally. The organized fun — though there were other, spontaneous, parties — centered around a lobster picnic on the shore, Friday evening, followed by a country dance, and a dinner Saturday, at the end of which the convention was formally adjourned. Dinner on Saturday was preceded by a reception given by the Bluenose Chapter.

Guest speaker at the more formal dinner was President Kirk Reid, whose enthusiasm for this excellent conference was reflected in every message he conveyed. Tuscor O'Neill of the Bluenose Chapter thanked President Reid for his address.

Several ceremonies at the dinner in-

LOCAL Activities meeting of current and incoming officers of Maritime Chapter, St. John, and Bluenose Chapter, Halifax.

CONGRATULATIONS! — says President Kirk Reid, right, to H. Douglas MacMackin, Chairman of the successful Maritime Conference, held at Amherst, Nova Scotia, June 6 and 7. Poster in front of the hotel advertises the conference.

THESE men, from the area's two Chapters, were responsible for one of the year's best I.E.S. meetings. Front row, seated: Bob Doull, Program; George Robinson, conference coordinator; Doug MacMackin, Chairman. Center row: Murray Kinkaid, Publicity; Don Shanks, Registration; Les Mackie, Finance. Back row: Ed Wilcox, Entertainment; Roly Webb, Program; Jim Smith, Hotel.

cluded a certificate of appreciation to Geoffrey Marshall, Bluenose Chairman, presented by Regional V-P Carl Wilson, prize for MMILJ to winner Don Myra, and coveted memberships in the Nova Scotia L'Ordre de Bon-Temps to the several visitors, the Reids, the Wilsons and Ruby Redford. Gifts were also presented to these visitors — Nova Scotia tartan caps and ties to the men, and handwoven woolen stoles of the same beautiful tartan to the ladies. Both the Reids and the Wilsons were also presented with original paintings by the well-known Nova Scotia artist, de Garthe.

In true convention tradition the program also featured golf tournaments, with prizes, and a ladies program including tours, coffee party, luncheon at the Golf Club, tea, and a bridge party.

Highlight for both men and women, however, was the lobster party and barn dance. Old clothes, sparkling June skies and as much lobster as one could eat retrogressed everyone back to his teens and all the fun that goes with that lighthearted period.

Credit Due

With so few local members to work on committees (Maritime Chapter membership is only 49), it is obvious that good planning was behind this conference. Great credit is due the committee personnel, and especially Chairman H. D. MacMackin and Conference Coordinator George Robinson. Their efforts were made worth it by the following committee workers:

Speakers and Program

Bob Doull — George Robinson
Bill Phillips — Roly Webb

Publicity and Entertainment

Murray Kincade — Ralph Rayworth
Roy Martin — Ed Wilcox

Hotel and Registration

George Mills — Don Shanks
Jim Smith

AND triumphant smiles — from Chairman MacMackin; J. Carl Wilson, Canadian Regional V-P; President Reid; George Robinson, coordinator, and Joe Thomas, Past V-P.

NEXT year's Maritime officers — Wilf McElman, Chairman, and Walter J. Lutes, incoming Secretary.

A NEW Deal in Home Lighting, by Frank G. Reid.

PLASTICS characteristics, by Peter Pangman, left. At rostrum, 1958-1959 Bluenose Chairman, Don Myra.

LUNCHEON address by Regional Veep Carl Wilson. Subject: the basis for the new footcandle recommendations.

Finance

Laurenz Harding — Doug MacMackin
Les Mackie — Clary Nickerson

For the record, the program of sessions is listed in its entirety:

Friday, June 6, 1958

Opening Luncheon.
Welcome by H. D. MacMackin, Chairman, Maritime Chapter.
Speaker, Miss Ruby Redford, Editor of ILLUMINATING ENGINEERING.

AFTERNOON SESSION

Chairman, Stanley B. Cassidy, Fredericton, N. B.
Mercury Lighting, M. I. Hague, Westinghouse Supply Co., Montreal, Que.
Developments in School Lighting, Darell B. Harmon. Paper presented by W. L. Vincent, Electrolier Mfg. Co., Montreal, Que.
Panel Discussion:
R. T. Dunn, Electrical Engineer, Edmundston.
Keith Graham, Architect, Halifax.
George Robinson, Department of Education, Fredericton.
A. W. Evans, Dept. Public Works, Halifax.

GIFTS all round. At a more formal dinner on Saturday night, visitors were presented with Nova Scotia mementoes. To Carl Wilson (photo at left) a tie, in Nova Scotia tartan of course, and (photo at right) to dinner speaker President Reid a tam-o'shanter. Other gifts also to Mrs. Reid, Mrs. Wilson and Ruby Redford were woolen stoles in the famous tartan. Making the presentations here is Geoff Marshall, Chairman of the Bluenose Chapter.

JUNE skies — and a lobster party. High spot of the fun was this old-fashioned lobster picnic on the grassy slopes

of the Nova Scotia shore. Country dance at a local "hall" wound it up.

Leave for Shore at Heather's Beach. Tours on Lobster Boats and Cyrus Eaton Home, Pugwash, N. S.
Barbecue Lobsters and Steaks on Beach.
Barn Dance, Heather's Beach.

Saturday, June 7, 1958

Early Birds Breakfast (with Alchometer).
Local Activities Meeting (At Breakfast).

MORNING SESSION

Chairman, Donald C. Myra, Bluenose Chapter.
Plastics in the Lighting Field, Peter Pangman, Canadian Industries, Ltd., Montreal, Que.
A New Deal in Home Lighting, F. G. Reid, John C. Virden Co., Toronto, Ont.
Our Streets Can Be Beautiful, Kirk Reid, General Electric Co., Nela Park, Cleveland, Ohio.
Luncheon—Speaker: J. Carl Wilson, Canadian Regional Vice-President.
Bluenose Chapter Reception.

AFTERNOON SESSION

Chairman, Sifroi LeBlanc, Moncton, N. B.
Church and Public Building Lighting, Edward Rambusch, Rambusch Decorating Co., New York, N. Y.
My Most Interesting Lighting Job Contest for Bluenose Chapter. Papers of Maritime Chapter winners and assorted slides.
Luminous Ceilings and High Frequency Lighting, B. W. Frank, Wakefield Company, London, Ont.
Bluenoes Chapter Reception.
Dinner, Presentation of Golf Prizes and Awards.
Speaker, Mr. Kirk Reid, President of I.E.S.

CBM Publishes Bi-Monthly Newsletter

The first issue of *CBM News*, bi-monthly newsletter published by Certified Ballast Manufacturers Association, has been published. Requests for copies of the two-side single-sheet multilithed bulletin should be sent to Don Julien, Secretary of CBM, 2116 Keith Bldg., Cleveland 15, Ohio.

MARITIME Conference attracted a large number of ladies. A few of them, here, at afternoon tea at the Fort Cumberland Hotel.

Allied Arts Activities In New Mexico, Arizona

Two neighboring I.E.S. groups in the Southwest have been engaged in holding active Allied Arts programs. In the Arizona Section's contest, nine students from the architectural department of Arizona State College at Tempe entered the contest. This year's problem was the lighting for a theatre and patio area, and the prize-winning solution was by Gerald Clark who received the $25 first place money. All contestants are students of George Allen, A.I.A.

In the New Mexico Chapter's competition, the problem was the lighting for an architect's office, and the $25 top prize went to Joe Boehning. Second place was taken by Don Shaffer and third by Jerry Torr. Lou Weller and Gaylord Gates were runners-up. Certificates were given to the three winners and student membership in I.E.S. was presented to all five by the Chapter. The entrants are now completing their fourth year at the University of New Mexico.

Fundamentals Course Presented By Vancouver Island Chapter

An eight-session course on Lighting Fundamentals has been presented by the Vancouver Island Chapter of I.E.S. Under the chairmanship of A. S. Harris, the course had a total enrolment of 73 and an average attendance of 45. The course

(*Continued on page* 12A)

ALLIED ARTS winner at University of New Mexico was Joe Boehning (left). Here, Carl W. Albach, member of the New Mexico Chapter's Allied Arts Committee, makes the presentation of the first prize check.

WINNER of Allied Arts contest sponsored by the Arizona Section of I.E.S. was Gerald Clark (right), senior student at Arizona State College. Making the presentation is Jerry Whitnell, Director of I.E.S.

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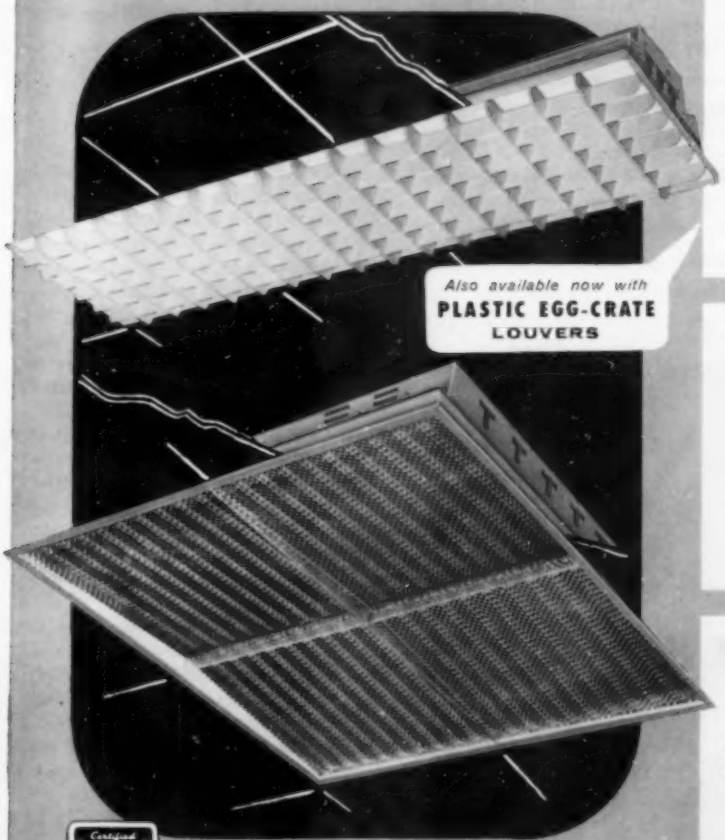

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TOTAL enrollment was 73 at Vancouver Island Chapter's Lighting Course.

(Continued from page 10A)

was designed for the average layman and the registrants came from all segments of the lighting industry. Program and speakers were:

January 14 — Light and Sight; Illumination Terms — Eric Ackland, Eric Ackland and Associates.
January 28 — Incandescent, Mercury and Fluorescent Lamps — Walter Lind, Canadian General Electric Co.
February 11 — Illumination and Design — Percy Fletcher, Canadian General Electric Co.
February 25 — Industrial Lighting — Doug Gordon, British Columbia Electric Co.
March 11 — Office and Store Lighting — Fred Bolton, F. D. Bolton Ltd.
March 25 — Residential Lighting — Dorothy McGregor, British Columbia Electric Co.
April 8 — Garden and Exterior Lighting — J. Spencer, Canadian General Electric Co.
April 22 — Lighting Economics — Jack Gilbreath, Holophane Co.

Forum and Competition — Two-Part New York Meeting

A technical forum on "Lighting of School and Community Stages and Auditoriums" and an architectural lighting competition comprised the two parts of an afternoon and evening meeting of the New York Section on April 24.

Joel Rubin, of Kliegl Bros., was moderator at the afternoon forum, and panel members were: Robert MacKinnon, Ketchum & Sharp, Architects; Daniel J. Murphy, Foster and Caferelli, Engineers; and Alex Sitkin, Jaros, Baum & Bolles, Consulting Engineers.

Following dinner, at Luchow's, the finals of the architectural student competition were conducted, with students from Columbia University, Cooper Union for the Advancement of Science and Art and Pratt Institute as contestants. These students had all won prizes in preliminary contests within their schools.

Two first prizes were awarded, since the Pratt Institute students entered as teams representing both the architectural and design schools. A Pratt team of Leslie Sorel and William Godsall were recipients of one first prize, and Columbia University student Harold Van Omeren won the other. Second place was taken by Jack Orosz.

Judges in the preliminary contests were Herbert Hoffman, Sven Bruun and Rollo Gillespie Williams. Finals judges were Stanley McCandless, Berlon Cooper and Herbert Anderson. Rollo Gillespie Williams was also contest chairman.

AT THE final meeting of the eight-session Lighting Course conducted by the Vancouver Island Chapter of I.E.S. are: left to right; A. Stickney Harris, Course Chairman; Walter E. Beek, Chapter Secretary-Treasurer; Kenneth Reid, Vice-President, Pacific Northwest Region, and Jack Gilbreath, lecturer at the final session.

Residential Lighting Forum A Twin City Success

Planning for the highly successful Residential Lighting Forum, held March 25 in Minneapolis, began last November, and the response to it has again proved that organization pays off. The total attendance of 476 included home builders, electrical contractors, residential architects, decorators, utility personnel, distributors and manufacturers' representatives. The Forum was sponsored by the Residence Lighting Forum of the I.E.S. Twin City Section, the North Central Electrical League and the Northern States Power Co., in cooperation with the Minneapolis Home Builders Association, the St. Paul Home Builders Association, the National Electrical Contractors Association and the American Institute of Decorators.

The technical program took place in the afternoon and evening. G. William Frederick, General Electric Co., was first speaker on the program, with "Residential Light Sources." T. A. Earle, President of the Minnesota Chapter of the American Institute of Decorators, spoke on "Proper Lighting for Today's Living," giving the decorator's viewpoint on lighting problems. "Lighting — The New Dimension in Home Sales" was discussed by Pierson C. Cohen, of Lightolier, telling of how builders can use lighting to enhance their homes.

(Continued on page 17A)

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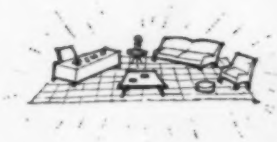

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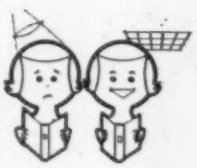

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Bonderite treated for corrosion resistance

UL approved wireway for 60° circuit wiring

Snap-out plastic guaranteed against discoloration

Rigid end plates for perfect alignment

Patented 45° swivel suspension system

Heavy gauge, die-formed, slotted reflector

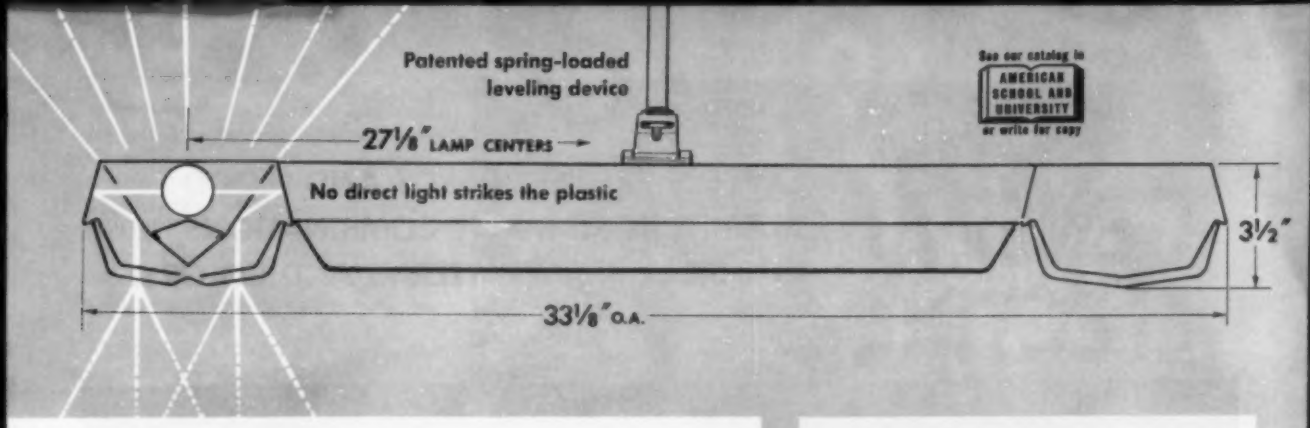
27 ¼" wide lamp spacing

visionaire

All-white appearance blends with ceiling

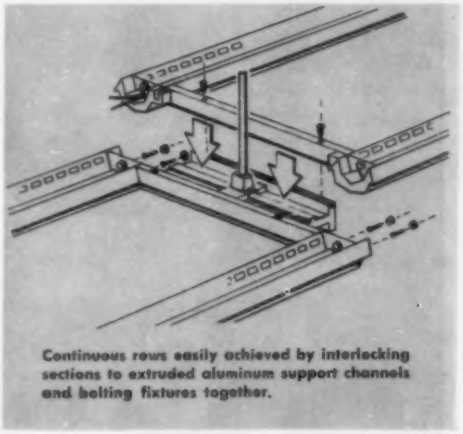
Snap-out ballast enclosure covers

Patents Pending


Patented spring-loaded leveling device
See our catalog in AMERICAN SCHOOL AND UNIVERSITY or write for copy
27⅛" LAMP CENTERS
No direct light strikes the plastic
3½"
33⅛" O.A.

A truly integrated, totally indirect lighting system, Sunbeam SIGHTLINE® is engineered to produce high intensity illumination with minimum "overhead" contrasts resulting in the most comfortable, glare-free seeing conditions. This is especially important in areas where visual tasks are critical. SIGHTLINE® excels in every respect to ASA School Lighting Standards. Crisp, clean, airy styling and thin, widely spaced cross channels of the all-white SIGHTLINE® system blends inconspicuously with most interiors. High efficiency of 82%, extremely low brightness of less than 100 ft-Lamberts on ribbed plastic diffuser and minimum maintenance means long-term economy. No direct light strikes the snap-out plastic assuring long life and freedom from discoloration.
The extruded aluminum cross channels provides more than solid support to the SIGHTLINE® system. They also effectively minimize ballast hum and dissipate ballast heat. A strong, test-proven suspension system with patented 45° swivels top and bottom allows maximum installation flexibility. An aluminum-alloy casting at the bottom incorporates a spring-loaded, self-leveling device and a finger-controlled fine vertical adjustment feature. For utmost simplicity, the SIGHTLINE® is easily ordered by complete rows as required by room size and lighting level desired.

Don't write your next "spec" until you've seen our complete brochure #A-2a.



Continuous rows easily achieved by interlocking sections to extruded aluminum support channels and bolting fixtures together.

Absolutely no glare, either direct or reflected, comes from SIGHTLINE® illumination. SIGHTLINE® illumination permits maximum visual acuity with no loss of contrasts at seeing task. SIGHTLINE® excels in every respect to ASA School Lighting Standards.

Sunbeam Lighting Company, 777 East 14th Pl., Los Angeles 21, California & Gary, Indiana

ONLY GENERAL ELECTRIC

OFFERS PRECISION SPOT AND FLOOD LAMPS IN SO MANY COMBINATIONS OF SIZES, BEAM PATTERNS AND COLORS!

GENERAL ELECTRIC PRECISION PAR LAMPS are rugged and weather resistant. They are built to take rough-duty treatment—indoors or out—because they're hard glass . . . and the sealed-in reflector never needs cleaning. (The 150-watt G-E PAR-38 needs no shielding against the weather—and it's available in six dramatic colors.) For information that will help you choose the right General Electric PAR or R Lamp for your specific spot or floodlighting job, check your local G-E Lamp Representative or write: General Electric Co., Large Lamp Dept. C-836, Nela Park, Cleveland 12, Ohio.

Progress Is Our Most Important Product

GENERAL ELECTRIC

(*Continued from page* 12A)

Following dinner, the evening program featured Miss Myrtle Fahsbender, Director of Residence Lighting, Westinghouse Electric Corp., Bloomfield, N. J., whose topic was "Flexibility—Keynotes Today's Living."

Co-Chairmen of the Forum were I. A. Schmuck and A. B. Hallaway, who presided over afternoon and evening sessions, respectively.

An exhibit of residence lighting fixtures was also part of the Forum, in an area adjacent to the meeting room. One booth displayed the "Live Better Electrically" Medallion Home.

OVERFLOW attendance at the Twin City Section Residential Lighting Forum, March 25, required the use of an extra room. Forum was co-sponsored by the North Central Electrical League, Northern States Power Co. and the I.E.S. group.

Ozark Chapter Holds Formal Charter Meeting

The Ozark Chapter of I.E.S. has probably set a record in achieving the official chartered status as a Chapter. Formed as a Study Club of the St. Louis Section on December 4, 1957, within six months the group qualified, having held three meetings with attendance of from 24 to 29. The chapter received its charter at the Midwestern Regional Conference in May.

Officers of the new Chapter were installed, at the May 28 official charter meeting, by Brooks Chassaing, incoming Vice-President of the Midwestern Region. Officers are: T. H. Condon, Chairman; Harold Stahl, Vice-Chairman; Robert Bare, Secretary-Treasurer; and Leon Roper, Jerry Wells and W. J. Marshall on the Board of Managers.

Translations Available for European Papers on Plastics

The Society of Plastics Engineers, Inc., announces that English translations of outstanding papers and articles from foreign countries in the field of plastics science and engineering will soon be made available by the publishers of *Kunststoffe* of Munich, Germany, a leading European plastics technical journal.

The usual German edition of *Kunststoffe* will be enlarged, starting with the July, 1958, issue, by adding a supplement, "German Plastics Digest," which will contain condensed English-language translations of the most important articles appearing in the journal.

Subscriptions for the expanded magazine are $32 annually, they report, and should be sent to Carl Hanser, Zeitschriftenverlag, GMBH, Munich 27, Germany.

Standard Phosphor Samples Available from NBS

The National Bureau of Standards has recently made available 14 standard samples of phosphors selected in cooperation with the Electrochemical Society. The samples were prepared under the supervision of Dr. A. F. Forziati in the dental research laboratory and may be obtained from the Standard Sample Section, National Bureau of Standards, Washington 25, D. C. The phosphor samples are for industrial and research use in quality control and development of improved phosphors. The main concern in preparing the samples was to achieve uniformity of characteristics, providing a fixed basis for comparison with other phosphors.

NEWLY chartered Ozark Chapter at their May 28 meeting. Left to right are: Robert W. Bare, Secretary-Treasurer; Harold Stahl, Vice-Chairman; T. H. Condon, Chairman; Phillip L. Roper, Master of Ceremonies; Ernie Mehl, guest speaker; Brooks Chassaing, I.E.S. Director; Richard Cohen, Chairman of the parent St. Louis Section; and Reverend George Wilson.

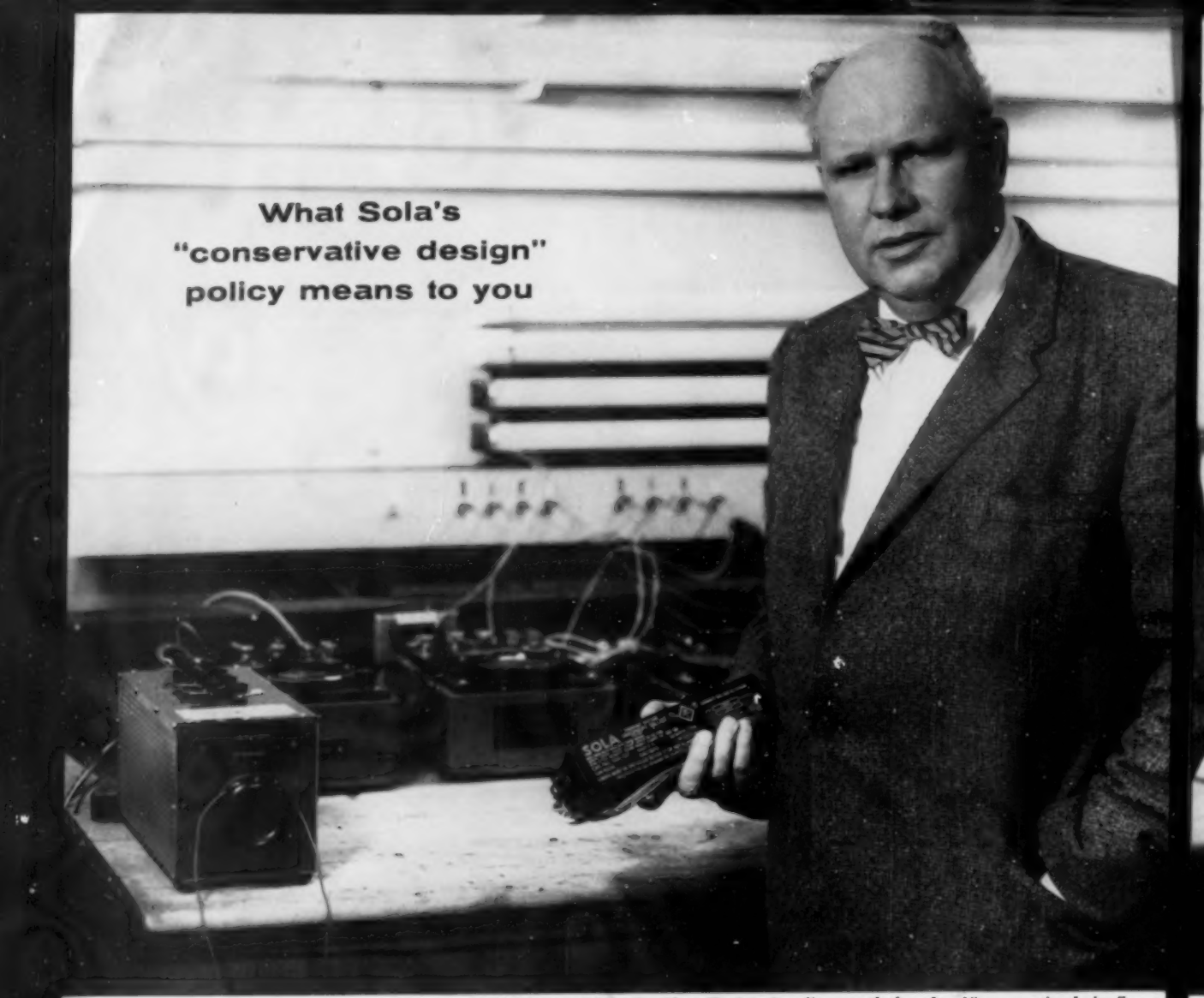
I.E.S. Officers Elected For Year 1958-1959

At a meeting of the I.E.S. Council held June 5, 1958, the report of the Committee of Tellers was presented, giving the results of the recent election of officers for the coming year, beginning October 1, 1958. The following have been elected to the offices indicated.

GENERAL OFFICERS

President — George J. Taylor, Day-Brite Lighting Inc., New York, N. Y.

(*Continued on page* 21A)



H. U. Hjermstad, Vice President, Engineering, discusses the benefits of "conservative design."

"You pay no premium price for cool, efficient, Sola Fluorescent Ballasts"

There's no need to pay a premium for a fluorescent ballast that will stay cool and still operate lamps at full rated light output. Because of Sola's policy of conservative design, we set product specs that assure *every* Sola Fluorescent Ballast will operate with maximum coolness and efficiency. We've *always* designed and built them to these standards.

Let's look at specifics. As an engineer, I've never been much impressed by charts, tables, and the like, which presume to make comparisons between several brands, but really just "compare" one specific make against some ambiguous make . . . or nothing at all. Perhaps you feel as I do that comparisons should be concrete.

At the right, you'll see a table listing CBM test data from Electrical Testing Laboratories, Inc. on a Sola Ballast for two 40w rapid-start lamps, Cat. No. 624-427. This is our regular, stock ballast, originally CBM certified on Dec. 19th, 1955. We've made no attempt to press comparisons on you. We'd rather that you evaluated the various brands yourself. We think that CBM test reports by E.T.L. are as impartial a source for comparative figures as you can find. See for yourself how Sola stacks up. Use CBM test data on other ballasts or run tests in your own lab. Note the figures in the columns provided. Then judge ballast quality on the facts.

Here is CBM test data on Sola ballasts... make your own performance comparison

CBM TEST DATA by ELECTRICAL TESTING LABORATORIES, INC.
ETL Report Number 90392-M, Date 6/6/57. Tested in ambient temperature of 38°C
SOLA BALLAST Cat. No. 624-427 for TWO 40-WATT RAPID-START LAMPS

Characteristic Under Test	CBM Specification ASA #C82.1	SOLA Cat. No. 624-427		BALLAST X		BALLAST Y		BALLAST Z	
		Values	Sola vs. CBM	Values	X vs. CBM	Values	Y vs. CBM	Values	Z vs. CBM
1. Open Circuit Voltage	Minimum allowable, 256 v. @ 106 v. primary Maximum allowable 300 v. @ 118 v. primary	@ 106 v. primary, 272 v. (average of 4 ballasts) @ 118 v. primary, 296 v. (average of 4 ballasts)	6.2% higher than minimum @ 106 v.						
2. Lamp Current Crest Factor	Maximum allowable, 1.70 @ 118 v. primary	1.57, (average of 4 ballasts on 8 lamps) @ 118 v. primary	7.64% better						
3. Maximum Coil Temperature Rise at Normal Operation	Maximum allowable, 65°C @ 118 v. primary	47.5°C @ 118 v. primary	26.9% cooler						
4. Light Output									
A. @ 118 v.	Minimum of 90% of reference lamp light output @ 118 v. primary	96.3% @ 118 v. primary	7% better						
B. @ 106 v.	Minimum of 75% of 118 v. light output measurement	91.8% @ 106 v. primary	27.8% better						
C. @ 130 v.	Maximum of 12.5% of 118 v. light output measurement	105.3% @ 130 v. primary	12.5% better						
5. Input Watts	None	91.4	Doesn't apply						

test this ballast yourself!

Perhaps you would like to find out first-hand just what this Sola Fluorescent Ballast for two 40-watt rapid-start lamps will do. The Sola Electric Co. will be glad to furnish any qualified organization with sample ballasts from stock. If you have a laboratory set-up for testing fluorescent ballasts, write to us on your letterhead. A Sola sales engineer will contact you and arrange to have these ballasts placed at your disposal. There will be no cost to you, of course, and no obligation. Address your letter to the Manager, Lighting Sales, Sola Electric Co., 4633 W. 16th St., Chicago 50, Illinois.

Sola Electric Co., 4633 W. 16th St., Chicago 50, Ill., Bishop 2-1414 • Offices in Principal cities • In Canada, Sola Electric (Canada) Ltd., 24 Canmotor Ave., Toronto 14, Ont.

SOLA

CONSTANT VOLTAGE TRANSFORMERS

REGULATED DC POWER SUPPLIES

MERCURY LAMP TRANSFORMERS

FLUORESCENT LAMP BALLASTS

extra large extrusions

KSH

extra complex extrusions

doing the "impossible" in plastics

Turning problem shapes into consistently uniform extrusions is a unique talent that has built KSH an industry-wide reputation for doing the "near impossible" in plastics! No challenge is considered too big or too tough. Remember, come to KSH for higher quality at a competitive price.

DESIGNERS • ENGINEERS • MANUFACTURERS

KSH

SALES OFFICES

KSH PLASTICS, INC. • HIGH RIDGE, MO.
Chicago, Ill. • Milwaukee, Wis. • Indianapolis, Ind.
Dayton, Ohio • Atlanta, Ga. • Grand Rapids, Mich.
St. Louis, Mo. • Red Bank, N. J. • Boston, Mass.

(Continued from page 17A)

Vice-President—Richard G. Slauer, Sylvania Electric Products Inc., Wheeling, West Va.
General Secretary — James R. Chambers, Appleton Electric Co., Chicago, Ill.
Treasurer — G. Franklin Dean, Toronto Hydro Electric System, Toronto, Ont.
Directors (Until 1961) — Ray P. Teele, National Bureau of Standards, Washington, D.C.; Joseph Thomas, Canadian General Electric Co., Ltd., Montreal, Que.
Regional Vice-Presidents — Great Lakes Region — Robert W. Brown, Cincinnati Gas & Electric Co., Cincinnati, Ohio; *Midwestern Region* — Brooks Chassaing, Chassaing Brothers —Lighting, Clayton, Mo.; *Northeastern Region* — Raymond L. Smart, Boston Edison Co., Boston, Mass.; *Pacific Northwest Region* — Beverly A. Travis, 407 Medical Arts Bldg., Seattle, Wash.; *South Central Region* — Jacob M. Gensburger, New Orleans Public Service Co., New Orleans, La.; *South Pacific Coast Region*—James E. Barnes, Pacific Gas & Electric Co., San Raphael, Calif.

Alabama Section

Chairman — Samuel Davidson, Alabama Power Co., Montgomery, Ala.
Vice-Chairman — M. R. Hazzard, 2105 3rd Ave. N., Birmingham, Ala.
Secretary — R. P. Fulmer, Westinghouse Electric Corp., Birmingham, Ala.
Board of Managers — E. W. Clark, J. T. Keyser, Jr., M. A. Perreault, E. B. Richey.

Alamo Section

Chairman — Richard W. Barnes, Rt. 10, Box 70, San Antonio, Texas.
Vice-Chairman — Kenneth L. Cotton, General Electric Co., San Antonio, Texas.
Secretary — Leonard M. Schwartz, 155 Alexander Hamilton, San Antonio, Texas.
Board of Managers — Hugh Acock, G. R. Rhine, W. S. Smith, M. E. Staley.

Arizona Section

Chairman — R. E. Tweedy, 356 East Alvarado Road, Phoenix, Ariz.
Vice-Chairman — R. W. Godemann, Arizona Public Service Co., Phoenix, Ariz.
Secretary — S. S. Lambe, 4010 East Cambridge, Phoenix, Ariz.
Board of Managers — William Benndorf, W. A. Blizzard, D. L. Roberts, J. A. Ware, Jr.

British Columbia Section

Chairman — E. N. Kolbeins, 768 W. 61st Ave., Vancouver, B. C.
Vice-Chairman — H. G. Foster, Northern Electric Co. Ltd., Vancouver, B. C.
Secretary — M. M. Hawkey, 2256 E. 12th Ave., Vancouver, B. C.
Board of Managers — J. E. Baker, D. McGregor, A. H. Cocking, M. A. Thomas.

Capital Section

Chairman — A. J. Rugo, Sylvania Electric Products, Inc., Alexandria, Va.
Vice-Chairman — E. F. Bailer, 3518 Farthing Drive, Silver Spring, Md.
Secretary — K. W. Cobb, 2430 Pennsylvania Ave, N. W., Washington, D. C.
Board of Managers — Benjamin Goodman, James Eliopolo, N. H. Boehm, T. T. Thurston.

Central New York Section

Chairman — J. S. Haney, Crouse-Hinds Co., Syracuse, N. Y.
Vice-Chairman — Robert Caryl, Donohue & Caryl, Syracuse, N. Y.
Secretary — R. C. Swanson, Jr., Niagara Mohawk Power Corp., Syracuse, N. Y.
Board of Managers — J. J. McVey, J. R. Nissen, J. E. Way, L. L. Sweetland, Jr.

Chicago Section

Chairman — J. J. McLaughlin, Kelso-Burnett Electric Co., Chicago, Ill.
Vice-Chairman — B. F. Avery, General Electric Co., Chicago, Ill.
Secretary — E. H. Ballet, 110 Albion St., Park Ridge, Ill.

LOOKING forward to the Second National Lighting Exposition, planned for March 1-4, 1959 at the New York City Coliseum, a joint press and honorary committee meeting was held recently. Left to right in photo are: Robert Fischer, *Architectural Record*; Joseph Villary, *Architecture and Design*; Thomas Smith Kelly, lighting consultant; Abe H. Feder, lighting designer; Dorothy Ross, public relations; Robert Busch, *Electrical Wholesaling*; Jo Anne Cornell, *Home Furnishings Daily*; Judith Spiegelman, *Newsweek*; Harold Meyer, president of the Exposition; Carol Levy, secretary; John Freeman, LLEMSA, sponsoring organization; Nathan Marcus, *Lighting*; Burt Westman, *Interior Design*; Melanie Kahane, interior designer; Wendy Buhr, *Interiors*; Berlon Cooper, *Electrical Construction and Maintenance*; and Morris Ketchum, Jr., architect.

Board of Managers — E. H. Witte, A. J. Morelli, Bernard Lazerson, W. F. Carson.

Cleveland Section

Chairman — L. O. Banahan, Ohio Edison Co., Akron, Ohio.
Secretary — W. H. Johnson, Westinghouse Electric Corp., Cleveland, Ohio.
Board of Managers — R. L. Carle, E. I. Creed, Theodore Summers, Jr., L. G. Davis, W. S. Fisher, Jr.

Connecticut Section

Chairman — Harold R. Young, 6 Pratt St., Rocky Hill, Conn.
Vice-Chairman — W. P. Carpenter, The Superior Electric Co., Bristol, Conn.
Secretary — R. H. Chase, Hartford Electric Light Co., Hartford, Conn.
Board of Managers — Theodore Ake, R. D. Babcock, J. B. Schonbrun, D. S. Gaidosz.

Cornhusker Section

Chairman — Ford E. Foster, 1006 North 20th St., Omaha, Nebr.
Vice-Chairman — H. J. Palmer, Iowa Public Service Co., Sioux City, Iowa.
Secretary — C. G. Christensen, Christensen Lighting, Omaha, Nebr.
Board of Managers — E. C. Knudson, D. W. Shoning, W. M. Scholes, W. J. Cook.

Eastern New York Section

Chairman — J. S. Baker, 609 Third Ave., North Troy, N. Y.
Vice-Chairman — J. M. Harney, Smith Electric Co. Inc., Cohoes, N. Y.
Secretary — J. C. Gould, Niagara Mohawk Power Corp., Albany, N. Y.
Board of Managers — W. J. Byrne, R. L. Cooper, S. E. Middlebrooks, G. C. Mills.

Eastern Pennsylvania Section

Chairman — R. J. Pretzman, Raub Supply Co., Lancaster, Pa.
Vice-Chairman — John R. Fritz, Gilbert Associates, Inc., Reading, Pa.
Secretary — R. A. Reynolds, 2704 Hillvale, West Lawn, Pa.
Board of Managers — J. H. Bicher, M. H. Ketner, H. F. Diehl, G. A. Solley.

Florida Section

Chairman — M. L. Markey, Jr., General Electric Co., Tampa, Fla.
Vice-Chairman — K. D. Brumbach, 1635 Stanford Lane, Sarasota, Fla.
Secretary — J. K. Boyle, Tampa Electric Co., Tampa, Fla.
Board of Managers — Seymour Bell, J. T. Dolphy, R. E. Herrick, H. L. Rhodes.

Georgia Section

Chairman — T. W. Haslam, Georgia Power Co., Atlanta, Ga.
Vice-Chairman — S. J. Andre, Georgia Power Co., Atlanta, Ga.
Secretary — P. W. Jeans, Sylvania Electric Products, Inc., Atlanta, Ga.
Board of Managers — J. J. Burns, John Brun, W. C. Fink, Judd Lough.

Golden Gate Section

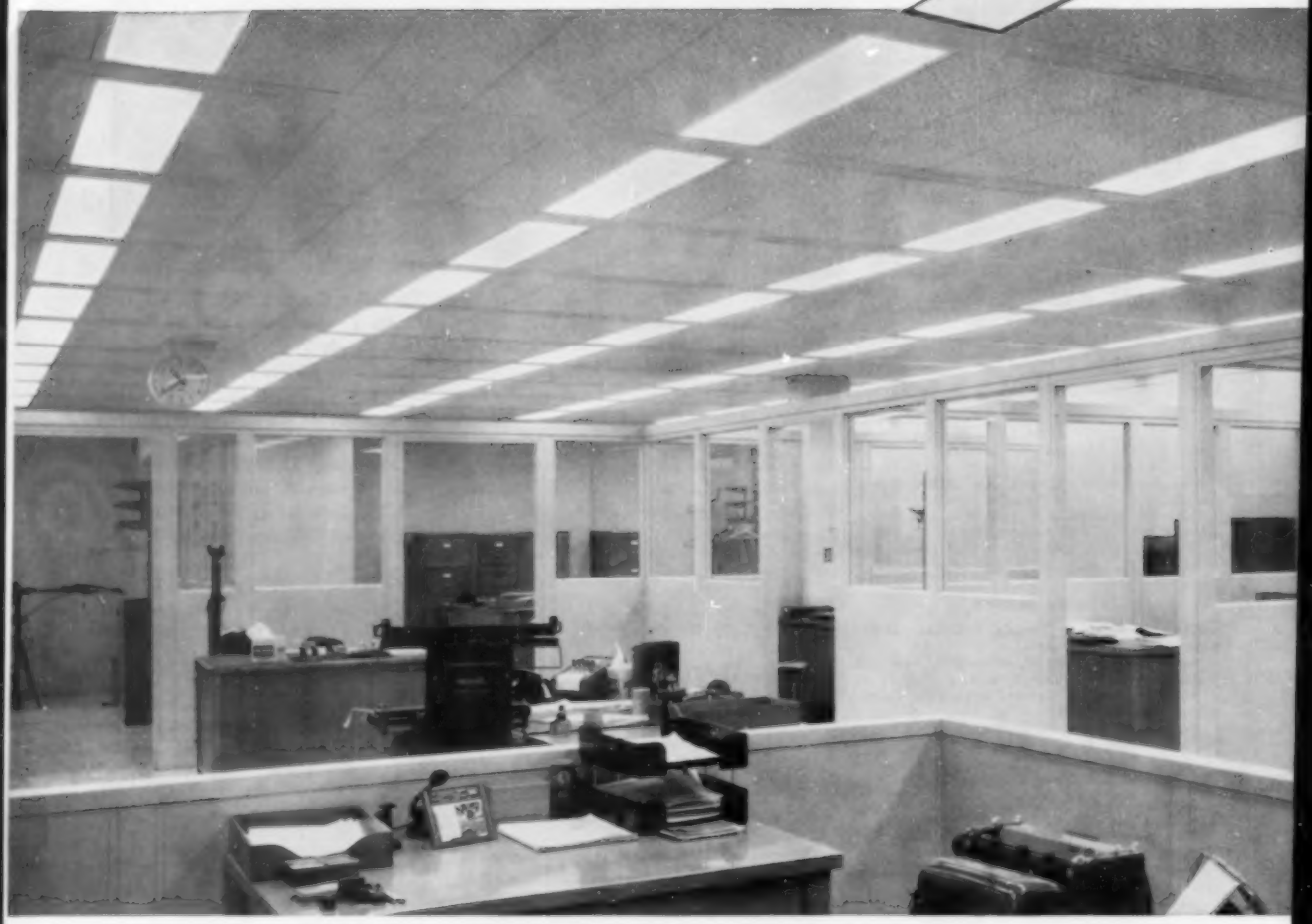
Chairman — J. C. Epperson, Peerless Electric Co., San Francisco, Calif.
Vice-Chairman — W. G. Bayha, Bayha Weir & Finato, San Francisco, Calif.
Secretary — Frank E. Duhme, Jr., 849 Tiburon Blvd., Tiburon, Calif.
Board of Managers — J. E. Barnes, G. de Leuze, J. L. Wrathall, H. A. Wright.

Heart of America Section

Chairman — John L. Krall, Sylvania Electric Products, Inc., Kansas City, Mo.
Secretary — R. W. Wilson, Boese, Hilburn Electric Co., Kansas City, Mo.
Board of Managers — C. L. Archart, I. J. Hedges, D. M. Ingwersen, F. P. O'Connor, T. C. Sidlo.

(Continued on page 24A)

Selected over 12



These lighting fixtures can be moved as easily as the office partitions.
Day-Brite Recessed Troffers are interchangeable with acoustical ceiling tiles, permit complete flexibility.

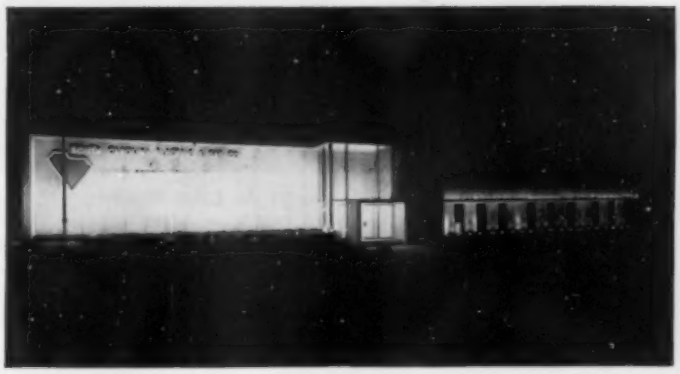
PROOF! No "or equal" can match Day-Brite!

Twelve different competitive fixtures were installed on a test basis in the new home of the South Carolina Electric and Gas Co. The architect and client each compared the fixtures *independently*, and both chose Day-Brite Troffers for the entire job.

Make your own comparison. Call your Day-Brite representative, listed in the Yellow Pages, for a demonstration. Compare Day-Brite fixtures side-by-side with any other fixtures at any price. Check features and value. Prove to your own satisfaction that Day-Brite fixtures have no "or equals."

Additional light where it is needed!
Extra row of Day-Brite Troffers above business machines (next to wall) provide 85 footcandles at work level.

competitive fixtures!



South Carolina Electric and Gas Co., Columbia, South Carolina.
HEYWARD S. SINGLEY, F.A.I.A., *Architect-Engineer;*
DUNN ELECTRIC CO., *Electrical Contractor.*

How Modular Lighting by Day-Brite helps Engineers LOWER CONSTRUCTION COSTS

In keeping with modern engineering practices, Day-Brite recessed fixtures are shallower and lighter, yet stronger. They take less space, can be mounted end-to-end or side-by-side, offer greater freedom of design.

Interchangeable with acoustical ceiling panels, they enable you to take full advantage of all the economies made possible by modular construction.

For more information on how Day-Brite equipment can help you coordinate lighting with ceilings in appearance, function and assembly, write for your copy of free booklet: "*Modular Lighting for Modular Measure.*"

Z-250

DECIDEDLY BETTER
DAY-BRITE
LIGHTING FIXTURES

Day-Brite Lighting, Inc.
6258 N. Broadway, St. Louis 15, Missouri
Day-Brite Lighting, Inc., of California
530 Martin Ave., Santa Clara, California

SEE OUR CATALOG IN SWEET'S ARCHITECTURAL FILE OR WRITE FOR COPY

NATION'S LARGEST MANUFACTURER OF COMMERCIAL AND INDUSTRIAL LIGHTING EQUIPMENT

TWO-DAY annual spring meeting of the I.E.S. Roadway Lighting Committee took place, May 8-9, at the Sheraton Hotel in Philadelphia. About 50 members and guests attended. In the photograph at left, in the usual order: Warren Edman; Dana Rowten, Committee Chairman; L. F. Heckman, Committee Secretary; W. B. Elmer; Albert Lorch. In photograph at right: R. M. Hoot, seated; R. M. Zabel, at rostrum.

(*Continued from page* 21A)

INDIANA SECTION

Chairman — N. J. Reinhart, 5627 Colburn Road, Indianapolis, Ind.
Vice-Chairman — A. S. Coffin, Jr., Public Service of Indiana, Inc., Plainfield, Ind.
Secretary — Cecil Adams, Scott Jaqua Co., Inc., Indianapolis, Ind.
Board of Managers — B. R. Boylan, E. M. Chellew, R. L. Peloquin, D. E. Weir.

IOWA SECTION

Chairman — E. W. Schoenherr, General Electric Co., Rock Island, Ill.
Vice-Chairman — Mary E. Stafford, Thomas Electric Co., Des Moines, Iowa.
Secretary — Richard F. Gruhl, Davenport Electric Contract Co., Davenport, Iowa.
Board of Managers — M. H. Galbraith, J. C. Ramsay, D. R. Schlader, G. L. Williams.

MARYLAND SECTION

Chairman — P. J. Puckett, Westinghouse Electric Corp., Baltimore, Md.
Vice-Chairman — J. D. Smith, General Electric Co., Baltimore, Md.
Secretary — Richard Dunlop, Dunlop Lighting, Baltimore, Md.
Board of Managers — P. K. Allen, J. C. Burdette, Jr., M. E. Gillespie, H. M. White.

MIAMI VALLEY SECTION

Chairman — J. F. McKeand, R. G. Helmig, Dayton, Ohio.
Vice-Chairman — Glenn A. Grier, Dayton Power & Light Co., Dayton, Ohio.
Secretary — Paul E. Wehner, R R #1, Byers Road, Miamisburg, Ohio.
Board of Managers — W. E. Blommel, Sr., B. A. Bordwell, E. A. Hart, Howard Wannemacher.

MICHIGAN SECTION

Chairman — Adriaan Vna Oss, 1023 W. Windemere, Royal Oak, Mich.
Secretary — E. W. Pratt, Detroit Edison Co., Detroit, Mich.
Board of Managers — W. A. Hedrich, Mary B. Taepke, D. J. Theisen, G. S. Thornton, M. V. Westrick.

MILWAUKEE SECTION

Chairman — M. H. Bruesewitz, Wisconsin Electric Power Co., Milwaukee, Wis.
Vice-Chairman — R. L. Wittenberg, Herman Andrae Electrical Co., Milwaukee, Wis.
Secretary — Edwin Schnoll, Schnoll Lighting Sales, Milwaukee, Wis.
Board of Managers — K. O. Hartwig, E. J. Heil, W. C. Kuhnke, R. J. Present.

MONTREAL SECTION

Chairman — Yvan Montcalm, Powerlite Devices, Ltd., Montreal, Que.
Vice-Chairman — J. E. Shepherd, Peerless Electric, Montreal, Que.
Secretary — W. G. Moore, 8390 Mayrand St., Montreal, Que.
Board of Managers — A. Dandenault, F. W. Fulle, Viateur Labbe, J. M. Wickett.

NEW ENGLAND SECTION

Chairman — E. O. Kassman, Westinghouse Electric Corp., Boston, Mass.
Vice-Chairman — R. E. Smith, Sylvania Electric Products Inc., Salem, Mass.
Secretary — John E. Carr, 54 Shiretown Road, Dedham, Mass.
Board of Managers — L. A. Bean, H. W. Crafts, Samuel Silberberg, R. F. Townsend.

NEW JERSEY SECTION

Chairman — R. L. Zahour, Westinghouse Electric Corp., Bloomfield, N. J.
Vice-Chairman — J. F. MacDougall, General Electric Co., Newark, N. J.
Secretary — J. I. Hargis, Hauser & Hargis, Bloomfield, N. J.
Board of Managers — E. C. Bataille, S. T. Bodine, M. N. Silverman, R. V. Smith.

NEW ORLEANS SECTION

Chairman — C. C. Kleinschmidt, P. O. Box 843, New Orleans, La.
Vice-Chairman — G. J. Segel, New Orleans Public Service, Inc., New Orleans, La.
Secretary — G. C. Schroeder, Jr., Schroeder & Associates, New Orleans, La.
Board of Managers — J. M. Ber, T. L. Hall, R. C. Paslay, J. A. Stelly.

NEW YORK SECTION

Chairman — J. W. Hamilton, Day-Brite Lighting Inc., New York, N. Y.
Vice-Chairman — W. H. Keen, General Electric Co., New York, N. Y.
Secretary — H. J. Peters, 323 84th St., Brooklyn, N. Y.
Board of Managers — A. H. Brooke, R. E. Crockett, H. J. Wald, R. G. Williams.

NORTH TEXAS SECTION

Chairman — Elmer L. Cole, Dallas Power & Light Co., Dallas, Texas.
Vice-Chairman — Paul A. Crick, The Miller Co., Dallas, Texas.
Secretary — W. T. Kimery, Dallas Power & Light Co., Dallas, Texas.
Board of Managers — T. L. Moore, H. D. Samuels, R. G. Turpin, M. C. Very.

NORTHWESTERN OHIO SECTION

Chairman — R. J. Gross, 3040 Darlington, Toledo, Ohio.
Vice-Chairman — R. H. Pippenger, General Electric Co., Toledo, Ohio.
Secretary — P. B. Hood, Eggleston & Son, Toledo, Ohio.
Board of Managers — L. J. Cole, D. I. Kirby, H. W. Teel, Jr., E. A. Winkeljohn.

OHIO VALLEY SECTION

Chairman — F. B. McRae, The Miller Company, Cincinnati, Ohio.
Secretary — H. J. Gruber, 4365 Kalama Ct., Cincinnati, Ohio.
Board of Managers — R. L. Campbell, Paul Coyle, P. H. Ward, L. G. Waldo, C. W. McFee.

OIL CAPITAL SECTION

Chairman — J. C. Netherton, Jr., 3130 East 44th St., Tulsa, Okla.
Vice-Chairman — R. Almond, Almond Electric Co., Tulsa, Okla.
Secretary — J. R. Seay, Seay Electric Co., Tulsa, Okla.
Board of Managers — J. C. Penafeather, C. H. Dollmeyer, H. O. West, A. T. Fisher.

OREGON SECTION

Chairman — D. W. Shirley, 3800 Harrison St., Corvallis, Ore.
Vice-Chairman — J. A. Schulter, 411 Weatherly Bldg., Portland, Ore.
Secretary — F. A. Farley, Benjamin Electric Mfg. Co., Portland, Ore.
Board of Managers — A. G. Miller, G. R. Barlogi, W. G. Pracejus, J. T. Cottingham.

OTTAWA SECTION

Chairman — W. G. McCormick, 128 Byron Ave., Ottawa, Ont.
Vice-Chairman — A. D. Miller, 1122 Bedbrooke St., Ottawa, Ont.
Secretary — M. J. Cote, 1800 Bank St., Ottawa, Ont.
Board of Managers — A. S. Kennard, G. D. Mills, C. O. Marchand, S. D. McGann.

PALMETTO SECTION

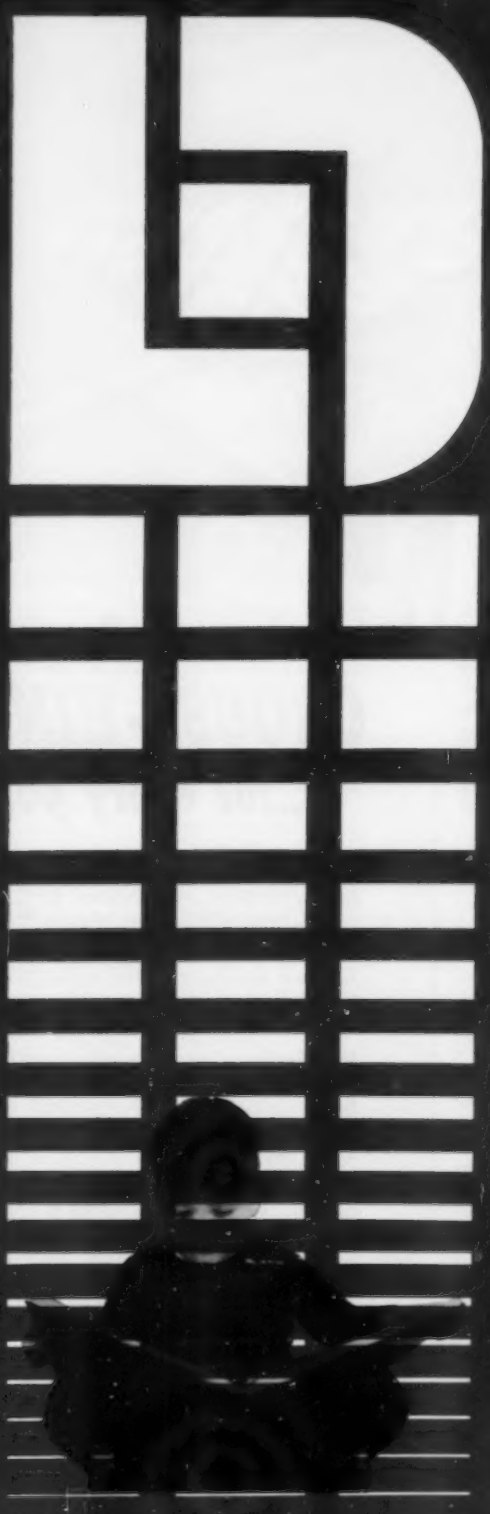
Chairman — H. O. Fellers, Jr., Westinghouse Electric Supply Co., Coulmbia, S. C.
Vice-Chairman — R. L. Adams, South Carolina Electric & Gas Co., Columbia, S. C.
Secretary — R. E. Faucett, General Electric Co., Hendersonville, N. C.
Board of Managers — E. B. Rogers, Jr., F. F. Smith, C. H. Rex, P. D. Burrell.

PHILADELPHIA SECTION

Chairman — T. G. Broussard, Westinghouse Electric Corp., Philadelphia, Pa.
Vice-Chairman — W. P. Graham, Philadelphia Electric Co., Philadelphia, Pa.
Secretary — E. H. Henrie, The Howard P. Foley Co., Philadelphia, Pa.
Board of Managers — V. W. Kafka, D. D. Lees, H. A. Williams, A. W. Hopkin.

(*Continued on page* 27A)

ANNOUNCING LIGHTING DYNAMICS



DEDICATED TO EXPLORING NEW FRONTIERS IN LIGHTING FOR TOMORROW'S MAN

The Atomic Age has created a host of new challenges. One is a zoning revolution in lighting equipment. Our challenge: to design lighting fixtures for the whole man, satisfying both his emotional needs and physical requirements. To meet this challenge, EXCO PRODUCTS COMPANY, a seventy year old manufacturing complex with 35 plants around the world, has created LIGHTING DYNAMICS. EXCO has acquired the two modern manufacturing facilities and skilled personnel of [illegible] in Dallas and Los Angeles. A new development and design department has been organized. And to ensure the highest quality control there are new photometric laboratories, new Ransburg double electrostatic painting equipment, and a new multi-stage Bonderizing process. WRITE FOR *the completely new catalog*.

LIGHTING FOR TOMORROW'S MAN is the goal objective of...

LIGHTING DYNAMICS

[illegible]
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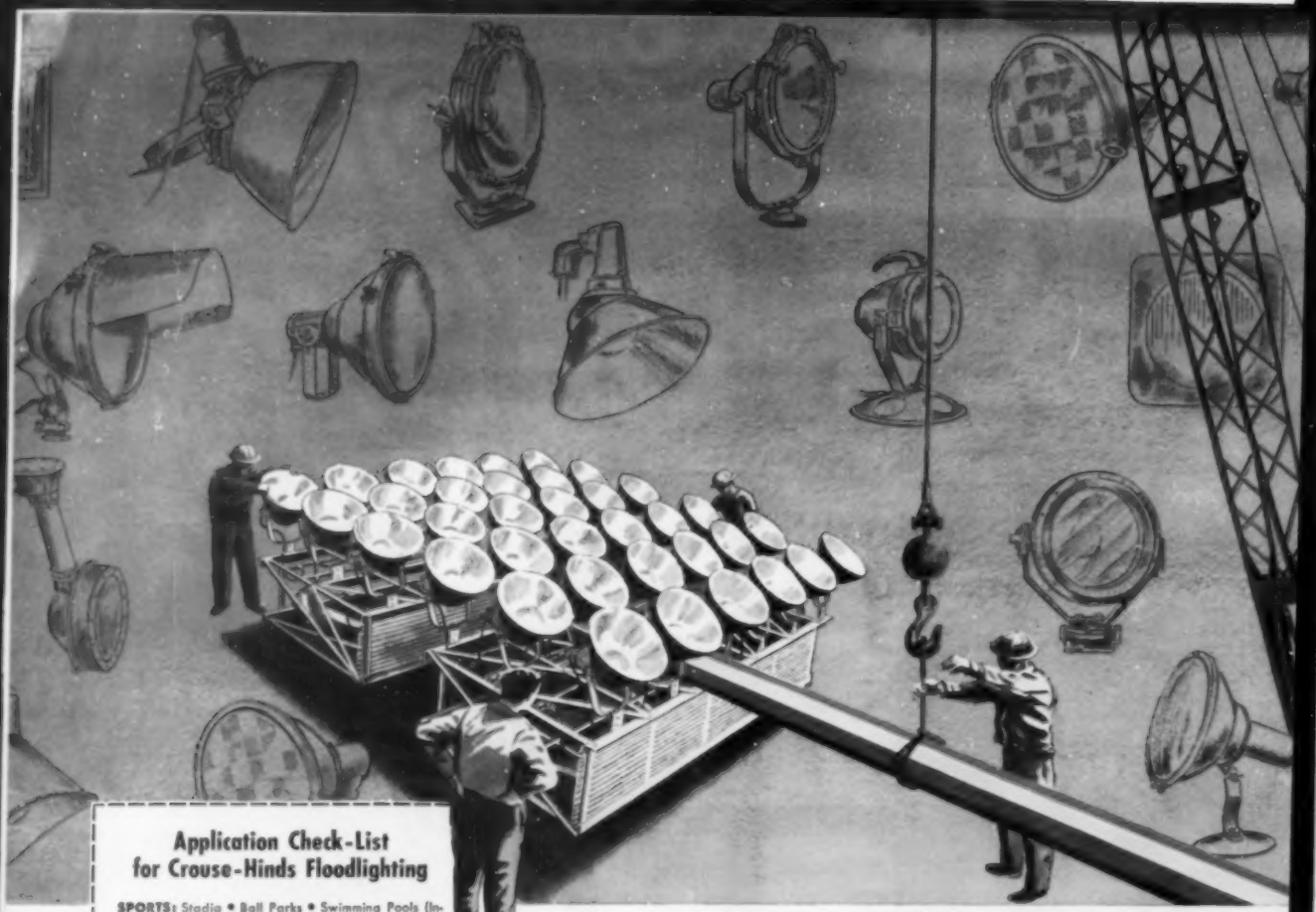
Whittier, California

DALLAS:
2703 Ambassador Row
Dallas, Texas



Application Check-List for Crouse-Hinds Floodlighting

SPORTS: Stadia • Ball Parks • Swimming Pools (Indoor & Outdoor) • Gymnasiums • All Summer & Winter Sports (Indoor & Outdoor)

DECORATIVE & DISPLAY: Statues, Fountains, Memorials & Monuments • Public Gardens • Building Fronts & Entrances • Park, Playground & Cemetery Entrances & Interiors

BUSINESS: Shopping Areas • Drive-Ins, Outdoor Theaters • Building Fronts & Entrances • Recreation Parks • Gas Stations

AIRPORT: Ramps • Boarding & Loading • Street & Road Approaches to Airport • Markers & Beacons • Emergency Portables

CONSTRUCTION: Roads & Streets • Dams, Seaways & Piers • Detours • Buildings • Reconstruction of Disaster Areas

INDUSTRIAL AND UTILITY: Parking Areas • Freight Yards • Weigh Stations • Docks & Piers • Staging Areas • Production Work Areas

TRAFFIC: Tunnels • Viaducts • Bridges • Underpasses • Walks • Public Squares, Thruway Interchanges & Rest Areas • Cloverleafs • Parking Areas

UNDERWATER: Swimming Pools (Indoor & Outdoor) • Marine Life Displays • Municipal Garden Pools • Aquariums • Divers' Portable Units

HAZARDOUS: Explosion-Proof Lighting for: Petroleum Refineries • Chemical Plants • Explosive Plants • Service Stations

SPECIAL PURPOSE: Plant Protection (Floodlighting for Safety) • Estate Lighting • Portable Floodlighting for Parades, Bandstands, etc.

Incandescent or Mercury Vapor...*you can get a*

CROUSE-HINDS Floodlight ...for every possible application

Name your floodlighting need – for construction, emergency, utility, traffic, display, decoration, sports, underwater, or hazardous-area use. Crouse-Hinds can supply floodlights *designed specifically for each application.*

A quick scanning of the widely varied applications included in the Check-List at left proves again that floodlights often provide *better light from few source points at less cost* than conventional lighting.

For the broadest experience and skill in every conceivable situation where floodlighting may be of use . . . call on Crouse-Hinds. Our field engineers will gladly assist with your planning. Just call your Crouse-Hinds distributor, or the nearest sales office or representative listed below.

Send us a brief description of your lighting problem, or an indication of the floodlight types in which you are interested. We will send literature containing product information applying to your problem by return mail.

A NATIONWIDE DISTRIBUTION exclusively through ELECTRICAL DISTRIBUTORS

CROUSE-HINDS COMPANY

Main Office and Factory: Syracuse, N. Y.
Crouse-Hinds Company of Canada, Ltd., Toronto, Ont.

Offices: Baton Rouge Birmingham Boston Buffalo Chicago Cincinnati Cleveland Corpus-Christi Dallas Denver Detroit Houston Indianapolis Kansas City Los Angeles Milwaukee New Orleans New York Philadelphia Pittsburgh Portland, Ore. Salt Lake City St. Louis St. Paul San Francisco Seattle Tulsa Washington RESIDENT REPRESENTATIVES: Albany Atlanta Baltimore Charlotte Chattanooga Jacksonville Reading, Pa. Richmond, Va. Shreveport

(*Continued from page 24A*)

PITTSBURGH SECTION

Chairman — J. S. Frizzell, Pittsburgh Reflector Co., Irwin, Pa.
Vice-Chairman — W. P. Thayer, General Electric Co., Pittsburgh, Pa.
Secretary — D. C. Thomas, 124 Barbour Drive, Pittsburgh, Pa.
Board of Managers — J. A. Hodges, L. W. Hornfeck, C. D. Miller, J. B. McNall.

PUGET SOUND SECTION

Chairman — R. E. Jones, 444 Dexter Horton Bldg., Seattle, Wash.
Secretary — G. D. Wirt, Puget Sound Power & Light Co., Bremerton, Wash.
Board of Managers — J. C. Berg, E. A. Matlock, C. R. Nelson, B. T. Heinz, J. H. Wells.

ROCHESTER SECTION

Chairman — A. G. Elley, Rowe Electric Supply Co., Inc., Rochester, N. Y.
Secretary — William Louden, Rochester Gas & Electric Corp., Rochester, N. Y.
Board of Managers — Frederick Schmidt, Carl Pollack, A. R. Principe, G. R. Butler, R. B. Thompson.

ROCKY MOUNTAIN SECTION

Chairman — L. S. Reed, L. S. Reed & Co., Denver, Colo.
Vice-Chairman — G. H. Patterson, General Electric Supply Co., Denver, Colo.
Secretary — Carl S. Long, Jr., Sylvania Electric Products, Inc., Denver, Colo.
Board of Managers — Leigh Congdon, D. Q. Ford, J. E. Watson, E. D. Heintze.

ST. LOUIS SECTION

Chairman — C. H. Zurheide, Smith, Hanlon, Zurheide, Levy, Inc., St. Louis, Mo.
Vice-Chairman — W. N. Mangold, General Electric Co., St. Louis, Mo.
Secretary — P. Q. Olschner, Westinghouse Electric Corp., St. Louis, Mo.
Board of Managers — R. D. Cohen, E. W. Stohlmann, Jr., R. J. Welch, E. C. Ryan.

SAN DIEGO SECTION

Chairman — R. W. Rohrback, 4626 Estrella Ave., San Diego, Calif.
Vice-Chairman — E. L. Peterson, Edward L. Peterson Co., San Diego, Calif.
Secretary — David F. Curtis, San Diego Gas & Electric Co., San Diego, Calif.
Board of Managers — W. J. Beran, A. C. Collins, Jr., C. W. Hotten, J. E. Reading.

SAN JACINTO SECTION

Chairman — George H. Simpson, 5226 Mercer, Houston, Texas.
Vice-Chairman — R. C. Jung, General Electric Co., Houston, Texas.
Secretary — D. L. Copeland, Crouse Hinds Co., Houston, Texas.
Board of Managers — J. A. Chrismer, A. M. Rice, G. L. McGonigle, G. W. Burgess.

SOUTHEAST FLORIDA SECTION

Chairman — Paul Foster, Foster Electric Co., Miami, Fla.
Vice-Chairman — Frank E. Yanaros, Florida Power & Light Co., Miami, Fla.
Secretary — George H. Gill, Century Lighting Inc., North Miami, Fla.
Board of Managers — F. W. Markland, C. O. Grannis, W. F. Holtsinger, J. A. Foerster.

SOUTHERN CALIFORNIA SECTION

Chairman — To be announced.
Vice-Chairman — Frank B. Lee, General Electric Co., Los Angeles, Calif.
Secretary — B. J. Hartmann, Flood-Lite Service, Los Angeles, Calif.
Board of Managers — R. E. Bevan, E. J. Fraser, R. H. Kreyser, J. S. Hamel.

TAR HEEL SECTION

Chairman — James A. Lowe, Duke Power Co., Greensboro, N. C.

PRESIDENT'S Night at the Georgia Section. Left to right in photo: Tom Haslam, Mrs. Walter Fink, I.E.S. Vice-President J. B. Browder, Mrs. Kirk M. Reid, President Kirk M. Reid, Section Chairman Walter Fink, Mrs. Browder, Bob Kuzell and Mrs. Kuzell.

Vice-Chairman — T. L. Cordle, J. N. Pease & Co., Charlotte, N. C.
Secretary — E. C. Gatewood, 4400 Collingwood Drive, Charlotte, N. C.
Board of Managers — L. M. Massey, P. C. Butler, D. E. Rouse, Alexander Springs.

TENNESSEE VALLEY SECTION

Chairman — James D. Harris, Nashville Electric Service, Nashville, Tenn.
Vice-Chairman — J. R. Harrell, Tafel Electric & Supply Co., Nashville, Tenn.
Secretary — W. E. Jones, Nashville Electric Service, Nashville, Tenn.
Board of Managers — J. L. Simpson, Jr., W. B. Taylor, Earl Pond, J. W. Shumate.

TORONTO SECTION

Chairman — E. Machtinger, Crouse-Hinds Co. of Canada, Ltd., Scarboro, Ont.
Vice-Chairman — R. P. Lindsay, Canadian Line Material Ltd., Toronto, Ont.
Secretary — A. W. Henschel, 51 Wellington St., W., Toronto, Ont.
Board of Managers — A. J. Brown, K. Tate, K. R. Ormrod, N. W. Bethune.

TWIN CITY SECTION

Chairman — F. T. Tillemans, Westinghouse Electric Corp., Minneapolis, Minn.
Vice-Chairman — J. C. Newhouse, Northern States Power Co., Minneapolis, Minn.
Secretary — John Bahnak, 711 S. Lake St., Minneapolis, Minn.
Board of Managers — G. W. Frederick, W. T. Mareck, R. J. Graf, R. W. Voight.

UTAH SECTION

Chairman — J. W. Lowder, Stevens Sales Co., Salt Lake City, Utah.
Vice-Chairman — J. H. Shaw, Utah Power & Light Co., Salt Lake City, Utah.
Secretary — To be announced.
Board of Managers — S. A. Bloomquist, E. D. Peterson, A. B. Rudy, C. J. Vacher.

VIRGINIA SECTION

Chairman — T. P. Harris, Jr., 6037 Bonneau Road, Richmond, Va.
Vice-Chairman — W. G. Cornelius, 2112 Whitewood Road, Richmond, Va.
Secretary — L. S. Reams, Yarmouth Circle, Richmond, Va.
Board of Managers — W. L. Jinkins, G. M. Delano, John Ludwig, W. A. Mitchell.

WESTERN MICHIGAN SECTION

Chairman — William Winglar, 63 W. State St., Grandville, Mich.
Vice-Chairman — L. L. Nurnberger, Consumers Power Co., Traverse City, Mich.
Secretary — S. A. Faren, Graybar Electric Co., Inc., Grand Rapids, Mich.
Board of Managers — J. Q. Miller, R. G. Laskowski, R. W. McGuire, R. C. Graham.

WESTERN NEW YORK SECTION

Chairman — Robert B. Herget, Robertson Electric Co., Inc., Buffalo, N. Y.
Secretary — W. J. McCarthy, Niagara Mohawk Power Corp., Buffalo, N. Y.
Board of Managers — W. E. Hayes, W. B. Campbell, F. B. Burke, B. F. Lythe, Jr., L. P. Gauthier.

ABOUT PEOPLE

Louis E. Barbrow, I.E.S. Fellow, was the recipient of the meritorious service award from the U. S. Department of Commerce. Mr. Barbrow was cited for a major contribution to the establishment of photometric standards on a fundamental basis and for outstanding service as an administrator of research and testing projects in the fields of photometry and colorimetry. An active member of the Capital Section and the Papers Committee of I.E.S., Mr. Barbrow is also a member of the American Institute of Electrical Engineers, the Optical Society of America and several other organizations. He is active in the International Commission on Illumination (C.I.E.) and serves as Secretary of the U. S. National Committee of that organization.

Dr. Robert S. Wiseman was recently promoted to the position of Assistant Chief of the Warfare Vision Branch of the U. S. Army Engineer Research and Development Laboratories, Fort Belvoir, Va. The Warfare Vision Branch per-

(*Continued on page 28A*)

(Continued from page 27A)

forms basic and applied research in the fields of near infrared and illumination phenomena, materials, components and techniques required for the development of night vision equipment.

R. D. Burnham announces the formation of a new engineering organization devoted primarily to the field of high-frequency lighting, to provide clients with application engineering service, research and development and specialized components for high-frequency systems for lighting and equipment fields. The company is located in Vermilion, Ohio.

Appleton Electric Co. has announced the appointment of **Kenneth O. Schneider** as vice-president in charge of manufacturing. Mr. Schneider, who joined the company in 1949 as an industrial engineer served as works manager of the Chicago plant from 1954 until the present time. Also announced by Appleton was the promotion of **Murray J. Mauritzen** from production control manager to works manager.

CERTIFICATE shown to a beneficiary of winning lighting job. Father Thomas F. Durkin, Administrator of the St. Louis Cathedral on the steps of his church, the lighting of which won first place in the St. Louis Section's contest for MMILJ. Co-entrants are, left to right: H. J. Zepf, Louis S. Sachs and H. J. Poehling.

F. I. "Tug" Wilson, who has been sales manager of the Wakefield Co., Vermilion, Ohio, since 1923, has recently been elected vice-president — market development. **Daniel A. Schisler,** Mr. Wilson's assistant for the past two years, is the new sales manager for the company.

According to a recent announcement, **John W. Rayner,** director of personnel of the Benjamin Electric Manufacturing Co. has been appointed assistant secretary of the Des Plaines, Ill., firm.

Day-Brite Lighting Inc. announces the appointment of **Ellsworth S. Cabot** as general manager of industrial engineering for all Day-Brite plants. Mr. Cabot will transfer his offices from the company's plant in Santa Clara, Calif., to its St. Louis headquarters. New manager of the Day-Brite Santa Clara plant will be **James F. Brennan.**

Dr. Harold S. Black was the recipient of the 1957 Lamme Medal, presented during the opening session of the Summer General Meeting of the American Institute of Electrical Engineers. The medal was awarded to Dr. Black "for his many outstanding contributions to telecommunications and allied electronic arts."

Frank M. Ogden has been named manager of the newly combined photo-miniature lamp department of the Westinghouse Electric Corp. in Bloomfield, N. J. Mr. Ogden has been with Westinghouse since 1950 and was most recently marketing manager of the miniature lamp department.

Magni-Flood, Inc., of Mount Vernon, N. Y., has announced the appointment of **David Marx** as marketing and promotion manager. Mr. Marx, who has been with the firm for five years, started as sales agent for the New England territory.

The recent appointment of **Max E. Doney** as assistant sales manager of the Cleveland district for Sylvania Electric Products Inc. has been announced. Mr. Doney joined Sylvania in 1951 as a sales representative in Cincinnati and Toledo. For the past year he has been sales supervisor in the Cleveland district.

Richard D. Brew and Co., Inc., Concord, N. H., has announced that **Hans Meyer,** formerly associated with Epsco, has joined their engineering staff.

Arnold R. Lang has been appointed sales representative for residential equipment for the Federal Lighting Corp., a division of the Frankelite Co., Cleveland. Mr. Lang will handle the firm's residential line in Ohio, Michigan, Indiana and Kentucky.

J. A. Wilson Lighting and Display Co., Ltd., has announced several appointments resulting from a realignment of the company's sales districts. **K. Ross Meyrick** has been appointed district manager for the newly consolidated Ontario area, with **Arthur J. Cahill** as assistant sales manager. Mr. Meyrick and Mr. Cahill were formerly in the Toronto and western Ontario districts, respectively.

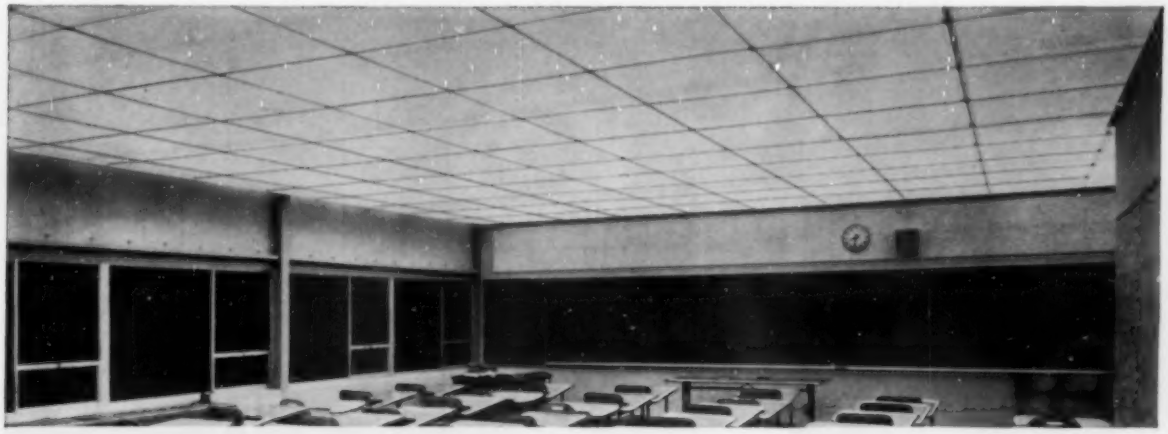
Condi-Lite Corp., New York, N. Y., has announced the appointment of **Ernest A. Haimes** of Amarillo, Texas, as district sales engineer for the Texas, Oklahoma and New Mexico territories.

J. B. Ogden, general manager of the air-conditioning division of the Whirlpool Corp., has been elected chairman of the new Room Air-Conditioner Section of

(Continued on page 40A)

Annual Meeting

In accordance with Article VIII Section 1 of the Constitution, the Annual Meeting of I.E.S. will be held in conjunction with the National Technical Conference in Toronto. By Council action, the meeting is scheduled for 10:15 a.m. in the Opening Session of the Conference, Monday, August 18th, at which time the National Officers will report to the membership.



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light without fatigue

Easy on the eyes, even for your youngest 'customer'! On one book, glare and harsh shadows. On the other, smooth, even light. Both light sources are identical.

But the luminous ceiling panel made of BAKELITE Brand Rigid Vinyl Sheet spreads the light, transforms the room. These panels are easy to install and maintain. In case of fire, they soften and fall before normal sprinkler operating temperatures are reached.

You can light any room of any size with a luminous ceiling made of BAKELITE Brand Rigid Vinyl Sheets. Get the facts by writing Dept. CX-82, Bakelite Company, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, N. Y.

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Choice of standard diffuser patterns. Or, custom made to your design. Write for catalogs.

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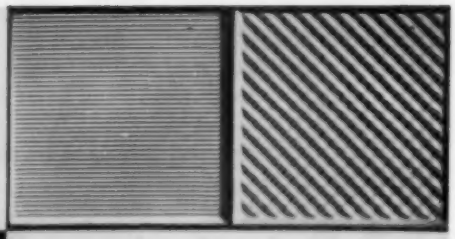
AREA/LITER®

Engineers who specify AREA/LITER® stay with AREA/LITER®. Invented and perfected by All-Brite AREA/LITER® is America's most widely installed surface or recessed modular fluorescent fixture.



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352 SHAW ROAD
SOUTH SAN FRANCISCO, CALIF.

PLANTS ALSO IN LOS ANGELES; PORTLAND, OREGON; AND VANCOUVER, B. C., CANADA.

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Acme Lighting & Mfg. Co.
949 E. 31st St.
Los Angeles 11, Calif. — *Albert Sultan*

Active Electric Co.
5450 W. Fullerton Ave.
Chicago 39, Ill. — *Robert W. Winne*

Advance Electric Supply Co.
1102 N. Saginaw St.
Flint, Mich. — *C. W. Schagane*

Advance Transformer Co.
2950 N. Western Ave.
Chicago 18, Ill. — *A. E. Feinberg*

Airport Electric Co.
6342 S. Central Ave.
Chicago 29, Ill. — *Alfred Fragala*

Alabama Power Co.
600 N. 18 St.
Birmingham 2, Ala. — *G. L. Morris*

Allied Chemical Corp.
Barrett Division
40 Rector St.
New York 6, N. Y. — *Dr. M. H. Bigelow*

Edw. P. Allison Co., Inc.
300 W. Washington St.
Chicago 6, Ill. — *C. W. Abrell*

Aluminum Co. of America
Alcoa Process Development Laboratories
P. O. Box 1012
New Kensington, Pa. — *R. F. VandenBerg*

Amalgamated Electric Corp. Ltd.
384 Pape Ave., Toronto, Ont. — *W. A. Dalrymple*

American Concrete Corp.
5092 N. Kimberly Ave.
Chicago 30, Ill. — *J. W. Lewis*

American Electric Construction Co. Inc.
4453 N. Central Ave.
Chicago 30, Ill. — *Clyde W. Grove*

American Electric Supply Co.
5010 W. Irving Park Rd.
Chicago 41, Ill. — *Herbert Schwartz*

American Electric Supply Co.
175 Ann St., Hartford, Conn. — *L. A. Senofonte*

American Sterilizer Co.
2426 W. 23rd St., Erie, Pa. — *Ernest L. Thompson*

Charles A. Anderson & Co.
1214 Nicollet Ave.
Minneapolis 4, Minn. — *George R. Anderson*

Appalachian Electric Power Co.
40 Franklin Rd., S. W., P. O. Box 2091
Roanoke, Va. — *G. J. Furr*

Appleton Electric Co.
1701-1759 Wellington Ave.
Chicago 13, Ill. — *Norton Appleton*

Arizona Public Service Co.
501 S. Third Ave.
Phoenix, Ariz. — *Don Willis*

Arkansas Power & Light Co.
Little Rock, Ark. — *Max Sudduth*

Name of official representative given in italics.

The Art Metal Co.
1814 E. 40th St.
Cleveland 3, Ohio — *G. E. Glatthar*

Atlantic City Electric Co.
1600 Pacific Ave.
Atlantic City, N. J. — *John B. Taylor*

B & A Electrical Contractors Inc.
3950 N. Clark St.
Chicago, Ill. — *Stanley Besyk*

Baltimore Gas & Electric Co.
1212 Lexington Bldg.
Baltimore 1, Md. — *M. C. Albrittain*

Benjamin Electric Mfg. Co.
Des Plaines, Ill. — *B. S. Benson, Jr.*

Black & McDonald Ltd.
101 Parliament St.
Toronto, Ont. — *W. J. McDonald*

The Blommel Sign Co.
735 Wayne Ave.
Dayton 10, Ohio — *W. E. Blommel*

Blue Ridge Glass Corp.
P. O. Box 631
Kingsport, Tenn. — *J. S. Herbert*

B M D and R Inc.
7020 Walker St., St. Louis Park
Minneapolis 16, Minn. — *Cecil H. Branham*

B & M Electrical Distributing Co.
2927 Fifth Ave.
Rock Island, Ill. — *Jack J. Zuckerman*

Board of Water and Light
116 W. Ottawa St., P. O. Box 570
Lansing 5, Mich. — *Roy Culham*

Boston Edison Co.
30 Boylston St.
Boston 12, Mass. — *R. B. Brown, Jr.*

British Columbia Electric Co. Ltd.
970 Burrard St.
Vancouver 1, B. C. — *Otto E. Zwanzig*

British Columbia Electric Co. Ltd.
820 Pandora Ave.
Victoria, B. C. — *W. C. Mearns*

Brockton Edison Co.
36 Main St.
Brockton 67, Mass. — *Louis F. Eaton*

Buck Electrical Contractors Inc.
5246 W. Fullerton Ave.
Chicago 39, Ill. — *Anton J. Mayer*

Butler Electric Co. Inc.
2832 Washington Ave.
St. Louis, Mo. — *Henry Arendes*

C. & M. Products Ltd.
124 Crockford Blvd.
Scarboro, Ont. — *J. J. Caragata*

Cadillac Electric Supply Co.
451 E. Larned St.
Detroit 26, Mich. — *H. C. Simonton*

California Electric Power Co.
P. O. Box 512
Riverside, Calif. — *Gordon F. Burgess*

Camber Lighting Inc.
37 Montgomery St.
Jersey City, N. J. — *Leonard Borko*

Cambridge Electric Light Co.
46 Blackstone St.
Cambridge 39, Mass. — *James L. Corrigan*

Canadian General Electric Co. Ltd.
Industrial Products Division
224 Wallace Ave., Toronto, Ont. — *A. C. Calderone*

Canadian General Electric Co. Ltd.
Lamp Division
165 Dufferin St., Toronto, Ont. — *E. H. Lindsay*

Canadian Line Materials Ltd.
Postal Station H
Toronto 13, Ont. — *M. L. E. Messinger*

Canadian National Exhibition Association
Exhibition Park
Toronto 13, Ont. — *H. E. McCallum*

Canadian Westinghouse Supply Co. Ltd.
195 Fleet St. E.
Toronto, Ont. — *S. W. McKnight*

Canning, Pekara Inc.
2144 N. Wood St.
Chicago 14, Ill. — *Claude E. Canning*

Central Electric Supply Co.
P. O. Box 267
Denver, Colo. — *Edward S. Goldman*

Central Hudson Gas & Electric Corp.
50 Market St.
Poughkeepsie, N. Y. — *J. E. Doolittle*

Central Illinois Light Co.
316 S. Jefferson Ave.
Peoria 2, Ill. — *J. W. Brown*

Central Illinois Public Service Co.
607 E. Adams St.
Springfield, Ill. — *B. L. Palm*

Central Louisiana Electric Co. Inc.
715 Main St.
Pineville, La. — *P. R. Taylor*

Central Maine Power Co.
9 Green St.
Augusta, Maine — *Roland W. Hess*

Central Power & Light Co.
P. O. Box 2121
Corpus Christi, Texas — *James M. Williams*

Century Lighting, Inc.
521 West 43rd St.
New York 36, N. Y. — *Edward F. Kook*

Champion Lamp Works
Division of Consolidated Electric Lamp Co.
330 Lynnway, Lynn, Mass. — *Carleton M. Holden*

Chicago Electrical Supply Co.
420 N. Ashland Ave.
Chicago 22, Ill. — *Charles Lechner*

Cincinnati Gas & Electric Co.
4th & Main Sts.
Cincinnati 1, Ohio — *J. R. Hartman*

City of Burbank — Public Service Dept.
P. O. Box 631
Burbank, Calif. — *Ralph Foy*

City of Glendale — Public Service Dept.
119 N. Glendale Ave.
Glendale 6, Calif. — *L. W. Grayson*

City of Riverside — Electric Light Dept.
P. O. Box 826
Riverside, Calif. — *Everett C. Ross*

City of Seattle — Dept. of Lighting
1015 Third Ave.
Seattle 4, Wash. — *P. C. Spowart*

City of Tacoma
Dept. of Public Utilities, Light Div.
P. O. Box 1639
Tacoma 1, Wash. — *Roy H. Weston*

The Cleveland Electric Illuminating Co.
75 Public Square
Cleveland 1, Ohio — *R. C. Hienton*

(Continued on page 32A)

(Continued from page 31A)

Columbia Electric & Mfg. Co.
1024 W. Ide Ave.
Spokane, Wash. *Walter A. Toly*

Columbus & Southern Ohio Electric Co.
215 N. Front St.
Columbus, Ohio *H. S. Corn*

Commercial Light Co.
841 W. Washington Blvd.
Chicago 7, Ill. *Michael R. Fine*

Commonwealth Edison Co.
Public Service Company Division
51 W. Jackson St., Joliet, Ill. *G. K. Hardacre*

Compco Corp.
2251 W. St. Paul
Chicago 47, Ill. *S. J. Zagel*

The Connecticut Light & Power Co.
P. O. Box 2010
Hartford, Conn. *A. M. Wade*

Consolidated Edison Co. of N. Y. Inc.
4 Irving Place
New York 3, N. Y. *G. J. Gillen*

Consumers Power Co.
212 W. Michigan Ave.
Jackson, Mich. *D. E. Karn*

Consumers Public Power District
1452 25th Ave.
Columbus, Nebr. *W. H. Sinke*

Continental Electrical Construction Co.
3540 Southport Ave.
Chicago 13, Ill. *Leo W. Witz*

Corning Glass Works
Corning, N. Y. *F. F. Fleischman, Jr.*

Coyne Electrical School Inc.
500 So. Paulina St.
Chicago 7, Ill. *John Hanan*

Crouse-Hinds Co.
Syracuse, N. Y. *John S. Haney*

Crouse-Hinds Co. of Canada, Ltd.
1160 Birchmount Rd.
Scarboro, Ont. *E. Machtinger*

Crownlite Fluorescent Co.
110 Windsor Ave.
Mineola, N. Y. *A. L. Siegel*

Curtis Lighting, Inc.
6135 W. 65th St.
Chicago 38, Ill. *John A. Wright*

Curtis Lighting of Canada, Ltd.
195 Wickstead Ave.
Leaside, Toronto, Ont. *H. L. Wright*

Cutler Electrical Products Inc.
5524 Haverford Ave.
Philadelphia 39, Pa. *David Cutler*

Dallas Power & Light Co.
1506 Commerce St.
Dallas 1, Texas *C. A. Tatum*

A. L. Davis Co., Inc.
101 Central Ave.
Newark, N. J. *Arthur L. Davis*

Day-Brite Lighting Inc.
5401 Bulwer St.
St. Louis 7, Mo. *D. J. Biller*

The Dayton Power & Light Co.
25 No. Main St.
Dayton 1, Ohio *H. S. Nonneman*

Dazor Manufacturing Corp.
4483 Duncan Ave.
St. Louis 10, Mo. *P. L. Read*

Delaware Power & Light Co.
600 Market St.
Wilmington 99, Del. *W. A. F. Pyle*

Dept. of Water & Power, City of Los Angeles
Box 3669 Terminal Annex, 207 So. Broadway
Los Angeles 54, Calif. *Ivan L. Bateman*

Detroit Edison Co.
2000 Second Ave.
Detroit 26, Mich. *L. E. Tayler*

The L. C. Doane Co.
10 New City St., Essex, Conn. *Harold F. Lorenz*

Dow Chemical Co.
Midland, Mich. *W. C. Goggin*

Duke Power Co.
P. O. Box 2178
Charlotte, N. C. *Roy A. Palmer*

E. I. du Pont de Nemours & Co., Inc.
Fabrics & Finishes Div.
Wilmington 98, Del. *Jack Rode*

E. I. du Pont de Nemours & Co., Inc.
Polychemicals Dept.
Development and Service Section
Wilmington 98, Del. *Henry Peterson*

Duquesne Light Co.
435 Sixth Ave., Pittsburgh 19, Pa. *G. W. Ousler*

Duro Test Corp.
2321 Hudson Blvd.
North Bergen, N. J. *James L. Cox*

Eastman Kodak Co.
400 Plymouth Ave. North
Rochester 4, N. Y. *H. R. Patterson*

Ebasco Services, Inc.
2 Rector St., New York 6, N. Y. *W. L. Byrne*

Efengee Electrical Supply Co.
949 W. Chicago Ave., Chicago 22, Ill. *Lee Mirus*

Electrical Supplies, Inc.
225 Walnut St.
Hartford 1, Conn. *Philip F. Walkley*

Electrical Testing Laboratories, Inc.
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New York 21, N. Y. *Hoffman S. Beagle*

Electrical Information Publications, Inc.
2132 Fordem Ave.
Madison 1, Wis. *D. W. Grosshandler*

Electrical Products Corp.
1100 No. Main St.
Los Angeles 12, Calif. *L. A. Rice*

Electrical Wholesalers, Inc.
229 Whitehall St. S. W.
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Electric Fixture & Supply Co.
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2505 E. Michigan Ave.
Jackson, Mich. *Blair McGowan*

Electrolier Mfg. Co. Ltd.
5849 Boyer St.
Montreal, Que. *Bernard Issenman*

Electro Silv-A-King Corp.
1535 S. Paulina St.
Chicago 8, Ill. *C. I. Schneider*

Emerson-Comstock Co., Inc.
130 No. Wells St., Chicago, Ill. *George A. Lang*

Emerson-Pryne Co.
P. O. Box 698, Pomona, Calif. *Roger W. Holston*

Ender-Monarch Corp.
50 Sylvester St., Westbury, N. Y. *Lewis Grenadier*

Englewood Electrical Supply Co.
5801-03 S. Halsted St.
Chicago, Ill. *J. P. Anderson*

Enterprise Electric Co.
6507 Euclid Ave.
Cleveland, Ohio *William S. Fell*

Fecht Electric, Inc.
5736 N. Western Ave.
Chicago 45, Ill. *William F. J. Fecht*

Federal Pacific Manufacturing Co.
19 Waterman Ave.
Toronto 13, Ont. *A. J. Brown*

Fenestra Inc.
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Detroit 11, Mich. *Clyde W. Kelly*

Fischbach, Moore & Morrissey, Inc.
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Chicago 2, Ill. *J. R. Meehan*

Fitchburg Gas & Electric Light Co.
537 Main St., Fitchburg, Mass. *A. G. Neal*

Flood-Lite Service Inc.
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Los Angeles 4, Calif. *B. J. Hartmann*

Florida Power Corp.
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St. Petersburg, Fla. *W. B. Shenk*

Florida Power & Light Co.
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Fluorescent Equipment & Mfg. Co.
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Cleveland 4, Ohio *Leonard S. Freeman*

Fluorescent Fixtures of California
352 Shaw Rd.
South San Francisco, Calif. *Ernest O. Anders*

Fluores-O-Lite Co.
Evans Terminal, North Broad St.
Hillside, N. J. *Meyer H. Silverman*

The Fostoria Pressed Steel Corp.
Fostoria, Ohio *E. L. Bates*

H. A. Framburg & Co.
3320-28 Carroll Ave.
Chicago 24, Ill. *Stanley A. Framburg*

The France Manufacturing Co.
10325 Berea Rd.
Cleveland 2, Ohio *E. L. Walter*

W. Freeman & Son, Ltd.
275 Woodland Drive
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27-01 Bridge Plaza North
Long Island City, N. Y. *E. W. Lampert*

Fullerton Manufacturing Corp.
Division of Franklin Research Corp.
P. O. Box 110
Norwalk, Conn. *Lawson Fullerton*

G. & M. Lighting Co.
4432 Olive St.
St. Louis 8, Mo. *Dan Michelson*

Garden City Plating & Mfg. Co.
1750 N. Ashland Ave.
Chicago 22, Ill. *G. G. Harney*

Garfunkel Co.
420-428 Hoboken Ave.
Jersey City, N. J. *Jack D. Saltzman*

General Electric Co.
Accessory Equipment Dept.
1285 Boston Ave., Bldg. 32-EE
Bridgeport 2, Conn. *W. B. Dexter*

General Electric Co., Ballast Dept.
1430 E. Fairchild St.
Danville, Ill. *C. G. Grant*

General Electric Co., Lamp Dept.
Nela Park
Cleveland 12, Ohio *A. C. Barr*

General Electric Co.
Outdoor Lighting Dept.
Hendersonville, N. C. *Henry J. Chanon*

General Electric Supply Co.
Div. General Electric Co.
1260 Boston Ave.
Bridgeport 9, Conn. *W. W. Booth*

General Fireproofing Co.
Dennick Ave.
Youngstown, Ohio *J. A. Saunders*

General Lighting Products Co.
468 Freylinghuysen Ave.
Newark 5, N. J. *N. H. Eglowstein*

The Georgia Power Co.
Electric Bldg., Atlanta 1, Ga. *C. M. Wallace, Jr.*

Gibson Manufacturing Co.
1919 Piedmont Circle, N. E.
Atlanta, Ga. *R. R. Gibson*

Gilbert Associates Inc.
525 Lancaster Ave.
Reading, Pa. *Arthur H. Phillips*

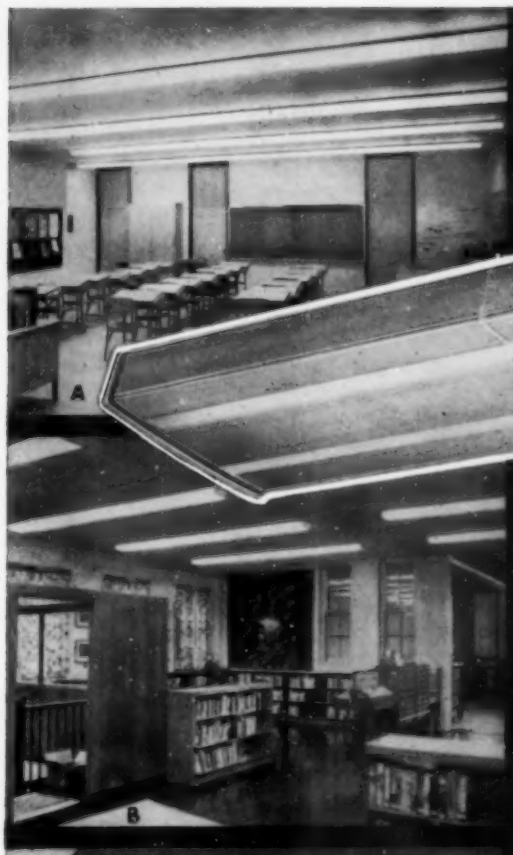
Glasco Electric Co.
721 N. 11th St.
St. Louis, Mo. *Willis M. Leach*

Globe Lighting Products Co. Inc.
1710 Flushing Ave.
Brooklyn 6, N. Y. *Isidor Rosenblatt*

Good Manufacturing Co. Inc.
1015 N. Halsted St.
Chicago 22, Ill. *Louis Mided*

Gould Electric Co.
2621 West Belmont Ave.
Chicago 18, Ill. *E. A. Gould, Jr.*

(Continued on page 34A)



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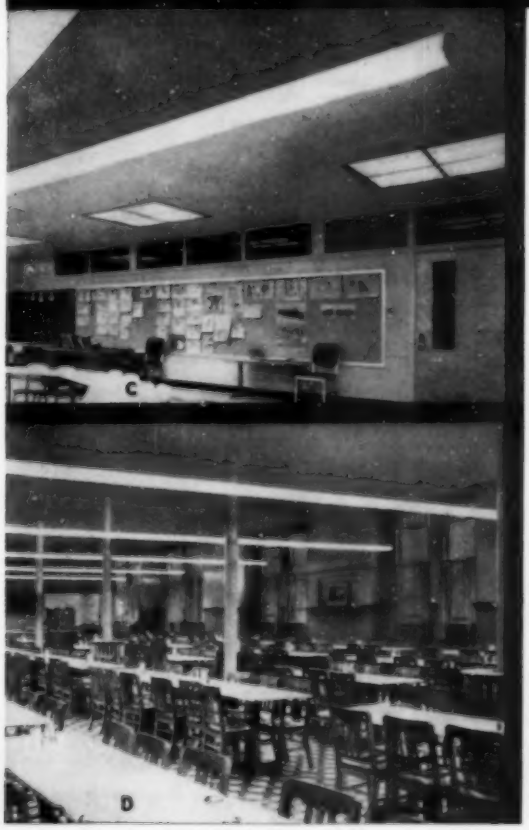

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(Continued from page 32A)

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833 State St.
New Haven, Conn. *Malcolm Rosen*

Graybar Electric Co. Inc.
420 Lexington Ave.
New York 17, N. Y. *Raymond C. Kinney*

Grimes Manufacturing Co.
515 No. Russell St.
Urbana, Ohio *L. B. Moore*

Guardian Light Co. Inc.
500 North Blvd., Oak Park, Ill. *W. S. Akely*

Gulf States Utilities Co.
P. O. Box 2951
Beaumont, Texas *R. A. Landry, Jr.*

The Edwin F. Guth Co.
2615 Washington Ave.
St. Louis 3, Mo. *Fred E. Guth*

Hahn Electric Co. Inc.
Manchester & Barrett Station Rd.
P. O. Box 3848, Kirkwood 22, Mo. *R. Hahn, Jr.*

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Cleveland 11, Ohio *Ray T. White*

Harjohn Industries
P. O. Box 66, St. Catherines, Ont. *H. D. Hallett*

The Hartford Electric Light Co.
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Hartford 3, Conn. *V. J. Ouellette*

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1447 Washington Blvd.
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Hecker and Co., Inc.
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Hexcel Products Inc.
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187 Columbus Ave.
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Phil R. Hinkley Co.
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House-O-Lite Corp.
2430 S. Ashland Ave.
Chicago 8, Ill. *Jack R. Stone*

Hub Electric Co.
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Hubbard and Co.
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Pittsburgh 1, Pa. *C. C. Warne, Jr.*

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620 University Ave.
Toronto 2, Ont. *A. W. Manby*

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623 W. Monroe St.
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Ideal Industries, Inc.
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Sycamore, Ill. *G. B. Koch*

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Hazel Park, Mich. *Bert C. Pretzer*

Incandescent Supply Co.
647 Mission St.
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2101 Spy Run Ave.
Fort Wayne, Ind. *J. H. K. Shannahan*

Interstate Power Co.
1000 Main St., Dubuque, Iowa *R. C. Halcombe*

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Box 351, Cedar Rapids, Iowa *Sutherland Dows*

Iowa-Illinois Gas & Electric Co.
United Light Bldg.
Davenport, Iowa *Gordon Ames*

Iowa Power & Light Co.
312 Sixth Ave.
Des Moines 3, Iowa *N. Bernard Gussett*

Iowa Public Service Co., East Division
400 Commercial St.
Waterloo, Iowa *C. R. Wagoner*

Iowa Public Service Co., Sioux City Division
P. O. Box 778
Sioux City, Iowa *C. R. Tracy*

Jeanette Shade & Novelty Co.
N. Fourth St.
Jeanette, Pa. *Donald H. Crock*

Jefferson Electric Co.
Bellwood, Ill. *W. C. Anderson*

Jersey Central Power & Light Co.
501 Grand Ave.
Asbury Park, N. J. *S. T. Bodine*

Jeryl Lighting Products, Inc.
42 W. Cermak Rd.
Chicago, Ill. *Chas. Meyerson*

Jewell Electric Products Inc.
266 Gleenwood Ave.
Bloomfield, N. J. *Donald J. Kantor*

Chas. Johnson Electric Co. Inc.
794 Lee St., Des Plaines, Ill. *R. A. Johnson*

Joslyn Mfg. & Supply Co.
3700 S. Morgan St.
Chicago 9, Ill. *J. H. Fahey*

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P. O. Box 679
Kansas City 10, Mo. *Glenn S. Young*

Kansas Gas & Electric Co.
P. O. Box 208
Wichita, Kans. *H. W. Hobson*

The Kayline Co.
2480 E. 22nd St.
Cleveland 15, Ohio *M. A. Eskins*

Thomas Keegan
20 Springdale Ave.
Massapequa, N. Y. *Thomas J. Keegan*

A. R. Keeler
2980 W. Davison
Detroit 38, Mich. *A. R. Keeler*

Kelso-Burnett Electric Co.
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Chicago 6, Ill. *Sigmund A. Hollinger*

Keystone Electric Manufacturing Co.
2228-36 E. Tioga St.
Philadelphia 34, Pa. *Leonard M. Siegel*

Kil Bar Electric Co.
2261 Clybourn Ave.
Chicago 14, Ill. *H. J. Kilburg, Jr.*

Kingsport Utilities, Inc.
422 Broad St.
Kingsport, Tenn. *J. E. Wright*

Kirby Risk Supply Co., Inc.
302 Ferry St.
Lafayette, Ind. *John C. Dewenter*

Kirchmer Bros. Mfg. Co.
2146 Newhouse Ave.
St. Louis 7, Mo. *A. W. Kirchmer*

The Kirlin Co.
3435 E. Jefferson Ave.
Detroit 7, Mich. *Ivan Kirlin*

Kliegl Bros.
321 W. 50th St.
New York 19, N. Y. *Robert A. Langer*

Knott & Mielly, Inc.
7724 South Racine Ave.
Chicago 20, Ill. *Charles S. Lott*

Koehler Electrical Supply Co. Inc.
284 Greenwich St.
New York, N. Y. *Robert A. Koehler*

Kopp Glass, Inc.
Swissvale, Pa. *Dr. C. E. Leberknight*

K-S-H Plastics, Inc.
Highway 30
High Ridge, Mo. *R. S. Hawes III*

LaSalle Electric Supply Co.
20216 John R. St.
Detroit 3, Mich. *A. H. Gatward*

Lawrence Electric Co.
3511 N. Cicero
Chicago 41, Ill. *Frank Heise*

The Leeds & Northrup Co.
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Philadelphia 44, Pa. *R. C. Machler*

Louis J. Lerro Co., Inc.
5127 N. Broad St.
Philadelphia 32, Pa. *A. L. Watmough*

Leviton Mfg. Co.
256 Greenpoint Ave.
Brooklyn 22, N. Y. *Jack Amsterdam*

Light and Power Utilities Corp.
1035 Firestone Blvd.
Memphis 7, Tenn. *Murray Reiter*

Lighting Dynamics, Inc.
802 West Whittier Blvd.
Whittier, Calif. *Al Jassim*

Lighting Products Inc.
2259 W. Park Ave.
Highland Park, Ill. *Eric H. Church*

Lighting Services Co.
515 Meriden Rd.
Waterbury, Conn. *Richard L. Platt*

Lightolier Co.
11 East 36th St.
New York 16, N. Y. *W. F. Blitzer*

Lightron of Cornwall
195 Hudson St.
Cornwall-on-Hudson, N. Y. *Eugene Littman*

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Milwaukee 1, Wis. *M. C. Harsh*

Litecontrol Corp.
36 Pleasant St.
Watertown 72, Mass. *Lawrence E. Brown*

Litecraft Manufacturing Corp.
8 East 36th St.
New York 16, N. Y. *Ben Roisman*

Lithonia Lighting Products Co. Inc.
Conyers, Ga. *Robert J. Freeman*

Long Island Lighting Co.
250 Old Country Rd.
Mineola, N. Y. *William J. Schmidt*

Louisiana Power & Light Co.
142 Delaronde St., Station A
New Orleans, La. *C. L. Osterberger*

Luminator, Inc.
120 N. Peoria St.
Chicago 7, Ill. *Albert L. Arenberg*

Luminous Ceilings Inc.
2500 West North Ave.
Chicago 47, Ill. *Louis Rosenstein*

Luxor Lighting Products Inc.
Empire State Bldg.
New York, N. Y. *Sergei Marketan*

Lynn Gas & Electric Co.
90 Exchange St.
Lynn, Mass. *Harold E. Ayer*

Macbeth Corp.
P. O. Box 950
Newburgh, N. Y. *Norman Macbeth*

MacNutt Electric Co. Inc.
420 Lexington Ave.
New York 17, N. Y. *M. R. Minto*

Madison Electric Co.
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Detroit 2, Mich. *Arthur H. Jones*

Magni-Flood, Inc.
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Mt. Vernon, N. Y. *Bert Greene*

Main Electric Co.
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Chicago, Ill. *William Kamin*

(Continued on page 36A)

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Major Equipment Co. Inc.
4603-19 Fullerton Ave.
Chicago, Ill. — *Ross O. Major*

R. A. Manning Co.
1810 North Ave.
Sheboygan, Wis. — *R. A. Manning*

Marvin Electric Manufacturing Co.
648 Santa Fe
Los Angeles, Calif. — *Howard Brinton*

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Boston, Mass. — *Jason Weinreb*

McNaughton-McKay Electric Co.
7000 Intervale Ave.
Detroit 38, Mich. — *William T. McNaughton*

McPhilbin Manufacturing Co., Inc.
1529 Willoughby Ave.
Brooklyn 37, N. Y. — *Edward L. Gluck*

McWilliams Electric Co. Inc.
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Meade Electric Co. Inc.
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Chicago 44, Ill. — *Henry E. Burkhardt*

Metalcraft Products Co. Inc.
Mascher & Lippincott Sts.
Philadelphia 33, Pa. — *Fred M. Pyle*

Metals Manufacturing Co.
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Salt Lake City, Utah — *G. D. Segerstedt*

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Detroit 21, Mich. — *Milton J. Doner*

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15th & Gentry Sts.
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Minneapolis 15, Minn. — *Don Carlson*

The Miller Co.
Meriden, Conn. — *John J. Neidhart*

Miller Electric Co. of Florida
575 Dora St.
Jacksonville, Fla. — *James Dandelake*

Mine Safety Appliances Co.
201 N. Braddock Ave.
Pittsburgh 8, Pa. — *R. E. Havener*

Mississippi Glass Co.
88 Angelica St.
St. Louis 7, Mo. — *C. J. Youngblood*

Mississippi Power & Light Co.
Lampton Bldg., Jackson, Miss. — *B. M. Davis*

Mississippi Power Co.
Gulfport, Miss. — *V. J. Daniel, Jr.*

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Rimouski, Que. — *J. Henri Labrie*

Modern Light & Equipment Co.
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Chicago, Ill. — *M. L. Offenberg*

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Thomas Industries Inc.
410 So. Third St.
Louisville 2, Ky. — *Frank Marriett*

Monongahela Power Co.
1310 Fairmont Ave.
Fairmont, W. Va. — *H. A. Stroud*

Monroe Electric Co.
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Chicago 10, Ill. — *Albert Kahn*

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Plastics Division
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Minneapolis 2, Minn. — *W. L. Hayes*

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Butte, Mont. — *D. J. McGonigle*

Morlite Equipment Co.
P. O. Box 106
Girard, Pa. — *Finley J. Gordon*

Multi Electric Mfg. Co.
4223-43 West Lake St.
Chicago, Ill. — *Leo J. McDonald*

Municipal Light & Power Dept.
City of Pasadena, California
302 City Hall, Pasadena 1, Calif. — *T. M. Goodrich*

Mutual Sunset Lamp Mfg. Co.
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New York 1, N. Y. — *Morris Thau*

The Narragansett Electric Co.
49 Westminster St.
Providence 1, R. I. — *C. R. Broadhead*

National Chemical & Manufacturing Co.
Luminall Paint Division
3617 S. May St.
Chicago 9, Ill. — *John Marshall Ziv*

National Electric Wholesalers, Inc.
4410 Georgia Ave. N. W.
Washington, D. C. — *David Leventhal*

Neo Ray Products Inc.
315 E. 22nd St.
New York 10, N. Y. — *Philip Young*

Nepo Mfg. Co.
4250 N. Sayre Ave.
Chicago 34, Ill. — *N. E. Passman*

Newark Electric Fixture Co.
288 S. 19th St.
Newark 3, N. J. — *J. B. Seidman*

New Bedford Gas & Edison Light Co.
693 Purchase St.
New Bedford, Mass. — *W. S. Fenstermacher*

New Haven Electric Supply, Inc.
135 Orange St.
West Haven, Conn. — *S. R. Shemitz*

New Jersey Power & Light Co.
105 E. McFarlan St.
Dover, N. J. — *E. J. VanDuzen*

Newman Schranz Lighting Co.
2700 Walnut
Denver, Colo. — *Charles Newman*

New Orleans Public Service Inc.
317 Baronne St.
New Orleans, La. — *E. N. Avegno*

N. Y. State Electric & Gas Corp.
62 Henry St.
Binghamton, N. Y. — *Earle C. Edwards*

Niagara Mohawk Power Corp.
300 Erie Blvd. W.
Syracuse 2, N. Y. — *F. T. McEvoy*

The NL Corp.
2480 E. 22nd St.
Cleveland 15, Ohio — *M. W. Terkel*

Noland Co.
27th St. & Virginia Ave.
Newport News, Va. — *C. P. Andrew*

North Central Electrical Distributing Co.
2001 Broadway St., N. E.
Minneapolis 13, Minn. — *A. G. Holmgren*

Northern Berkshire Electric Co.
21 Bank St.
North Adams, Mass. — *A. D. Rhodes*

Northern Electric Co. Ltd.
1600 Notre Dame St. W.
Montreal, Que. — *R. H. Probert*

Northern Indiana Public Service Co.
5265 Hohman Ave.
Hammond, Ind. — *J. C. Sackman*

Northern Light Co.
1657 N. Water St.
Milwaukee 2, Wis. — *Fred Cramer*

Northern States Power Co.
Minneapolis 2, Minn. — *Carl T. Bremicker*

Northland Electric Supply Co.
521 South 10th St.
Minneapolis 4, Minn. — *N. K. Gullick*

Nova Scotia Power Commission
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Halifax, N. S. — *W. D. Graham*

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235 East 5th South St.
Salt Lake City, Utah — *H. A. Schoepf*

Ohio Edison Co.
Akron 8, Ohio — *Franklyn Dickinson*

Ohio-Midland Light & Power Co.
Canal Winchester, Ohio — *J. E. Cathers*

The Ohio Power Co.
301-315 Cleveland Ave. S. W.
Canton 2, Ohio — *R. W. Osterholm*

Oklahoma Gas & Electric Co.
Box 1498, Oklahoma City 1, Okla. — *Earle W. Gray*

Omaha Public Power District
720 Electric Bldg.
Omaha 2, Nebr. — *E. E. Schwalm*

Pacific Gas & Electric Co.
245 Market St.
San Francisco 6, Calif. — *O. R. Doerr*

Pacific Power & Light Co.
920 S. W. Sixth Ave.
Portland 4, Ore. — *F. M. Reis*

Paramount Industries Inc.
G 1080 Ballenger Rd.
Flint, Mich. — *B. R. Bailey*

Peerless Electric Ltd.
5585 Fullum
Montreal 36, Que. — *L. A. Van Duzer*

William Penn Fluorescent Light Mfg. Co.
1429 South 23rd St.
Philadelphia 46, Pa. — *William Ranieri*

Pennsylvania Electric Co.
222 Levergood St.
Johnstown, Pa. — *R. G. Baker*

Pennsylvania Power & Light Co.
901 Hamilton St.
Allentown, Pa. — *H. H. Brenan*

Pennsylvania Power Co.
19 E. Washington St.
New Castle, Pa. — *P. G. Dingledy*

The Perfeclite Co.
1457 East 40th St.
Cleveland 3, Ohio — *Joseph L. Jaffe, Jr.*

Pfaff & Kendall
84 Foundry St.
Newark, N. J. — *M. J. Hamilton*

Philadelphia Electrical & Mfg. Co.
1228-36 N. 31st St.
Philadelphia 21, Pa. — *R. A. Manwaring*

Philadelphia Electric Co.
1000 Chestnut St.
Philadelphia 5, Pa. — *R. G. Rincliffe*

Phoenix Glass Co.
Monaca, Pa. — *D. G. Cameron*

Pierce Electric Co.
367 W. Adams St.
Chicago 6, Ill. — *John H. Pierce*

Pittsburgh Corning Corp.
Port Allegany, Pa. — *Howard F. Kingsbury*

Pittsburgh Plate Glass Co.
Grant Bldg.
Pittsburgh 19, Pa. — *R. G. Whittemore*

Pittsburgh Reflector Co.
405-411 Oliver Bldg.
Pittsburgh 22, Pa. — *R. C. Zinsmeister*

Plax Corp.
P. O. Box 1019, Hartford, Conn. — *C. N. Sprankle*

Poindexter Electric Co.
1433 Delaware St.
Denver, Colo. — *Robert J. Walsh*

Portland General Electric Co.
Portland, Ore. — *T. W. Fitch*

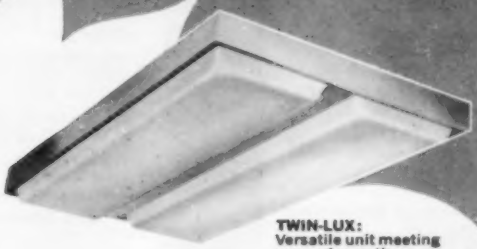
The Potomac Edison Co.
55 E. Washington St.
Hagerstown, Md. — *C. D. Lyon*

Potomac Electric Power Co.
929 E. Street, N. W.
Washington 4, D. C. — *George Bisset*

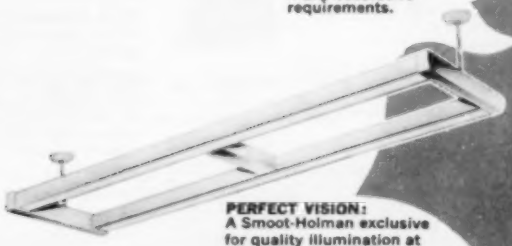
(Continued on page 38A)

SMOOT-HOLMAN

your best source for "tomorrow's lighting today"



TWIN-LUX:
Versatile unit meeting many decorative requirements.

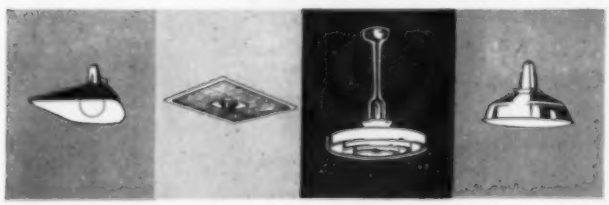


PERFECT VISION:
A Smoot-Holman exclusive for quality illumination at low cost.

SHALLOLITE:
Outstanding styling coupled with top lighting performance.

INDUSTRIAL FLUORESCENT:
Quality construction designed to RLM standards.

A complete selection of commercial fluorescent, industrial fluorescent, commercial incandescent, industrial incandescent and outdoor flood lighting equipment.



PROPER LAYOUT MADE EASIER! Send for your FREE Smoot-Holman "Lighting Guide" ...and auto-calculator to compute the required lamps and fixtures for most commercial and industrial interiors.

Certified Lighting

SMOOT-HOLMAN COMPANY · *Inglewood, California*

(Continued from page 36A)

Powerlite Devices Ltd.
54 Atomic Ave.
Toronto 14, Ont. *W. L. Hawley*

Prescolite Manufacturing Corp.
2229 Fourth St.
Berkeley 10, Calif. *W. D. Runswick*

Progressive Products Co. Inc.
6615 Milwaukee Ave.
Chicago 31, Ill. *E. George Goddard*

Prophylactic Brush Co.
Prolon Plastic Division
Florence, Mass. *John H. Moore*

Public Service Co. of Colorado
900 15th St.
Denver 1, Colo. *H. T. Rankin*

Public Service Co. of Indiana Inc.
1000 E. Main St.
Plainfield, Ind. *Robert McMurray*

Public Service Co. of New Mexico
P. O. Box 1360
Albuquerque, N. M. *T. F. Douglass*

Public Service Co. of Oklahoma
P. O. Box 201
Tulsa, Okla. *D. J. Frandsen*

Public Service Electric & Gas Co.
80 Park Place, Newark, N. J. *S. A. Moore*

The Public Utilities Commission
272 Dundas St.
London, Ont. *V. A. McKillop*

Puerto Rico Water Resources Authority
San Juan, Puerto Rico *M. C. Nazario*

Puget Sound Power & Light Co.
10608 N. E. 4th St.
Bellevue, Wash. *Frank McLaughlin*

Pyle National Co.
1334 N. Kostner
Chicago 51, Ill. *A. G. Foelkner*

Quadrangle Mfg. Co.
32 S. Peoria St.
Chicago 7, Ill. *D. E. Worrell*

Quebec Hydro-Electric Commission
107 Craig St. W.
Montreal, Que. *R. E. Gohier*

Quebec Power Co.
P. O. Box 1607
Quebec, Que. *Jean Saint-Jaques*

C. A. Rafel & Co.
2112 W. Lawrence
Chicago 25, Ill. *George A. Rafel*

Rambusch Decorating Co.
40 W. 13th St.
New York 11, N. Y. *Edward Rambusch*

Reliance Petroleum Ltd.
343 Richmond St.
London, Ont. *E. J. Lewicki*

Revere Electric Mfg. Co.
6009-17 Broadway
Chicago 40, Ill. *Murray J. Whitfield*

Revere Electric Supply Co.
2501 W. Washington Blvd.
Chicago 12, Ill. *Arthur Peterson*

Rite Lite Supply Co.
2826 No. Speer Blvd.
Denver 11, Colo. *Ralph H. Bryant*

Ritter Co., Inc.
400 West Ave.
Rochester 5, N. Y. *Horace W. Alexander*

Robert Manufacturing Co. Inc.
99 Dell Glen Ave.
Lodi, N. J. *Robert Geissenberger*

Rochester Gas & Electric Corp.
89 East Ave.
Rochester 4, N. Y. *L. C. Twichell*

Rockland Light & Power Co.
Nyack, N. Y. *D. S. Schaab*

Rohm & Haas Co.
222 W. Washington Sq.
Philadelphia 5, Pa. *H. A. Williams*

Rosemount Industries Ltd.
2090 Moreau St.
Montreal, Que. *Paul A. Ducasse*

Rumsey Electric Co.
1007 Arch St.
Philadelphia 7, Pa. *T. W. Lauer*

James E. Rust Electric Co., Inc.
1511 W. Jackson Blvd.
Chicago 7, Ill. *Earl C. Heller*

Ryall Electric Supply Co.
500 Lincoln St.
Denver, Colo. *C. O. Ryall*

Sachs Electric Corp.
5540 W. Park
St. Louis, Mo. *Luis Sachs*

Safety Industries, Inc. — Lighting Division
P. O. Box 70, Milford, Conn. *H. W. Jones, Jr.*

Safeway Stores, Inc.
Store Design Dept., 425 Madison St.
P. O. Box 440, Oakland 4, Calif. *A. W. Anderson*

St. Joseph Light & Power Co.
520 Francis St.
St. Joseph 2, Mo. *F. P. O'Connor*

Sandel Manufacturing Co.
3618 S. Loomis Place
Chicago 9, Ill. *A. L. Sandel*

San Diego Gas & Electric Co.
P. O. Box 1831
San Diego 12, Calif. *H. G. Dillin*

Saskatchewan Power Corp.
1739 Cornwall St.
Regina, Sask. *W. B. Clipsham*

Savannah Electric & Power Co.
Savannah, Ga. *J. L. Davidson*

Service Electric Co.
8345 South Ashland
Chicago, Ill. *Harold Zwitt*

Shalda Manufacturing Co. Inc.
Box 507
Burbank, Calif. *William Shalda*

Shawinigan Water & Power Co.
600 Dorchester St. W.
Montreal, Que. *Chas. H. Talbot*

The Sherwin-Williams Co.
101 Prospect Ave. N. W.
Cleveland 1, Ohio *J. A. Meacham*

Silvray Lighting, Inc.
R.K.O. Bldg., Radio City
New York 20, N. Y. *J. M. Gilbert*

Smithcraft Lighting Division
A. L. Smith Iron Co.
217 Everett Ave., Chelsea 50, Mass. *J. J. Smith*

Smoot-Holman Co.
P. O. Box 4097
Inglewood, Calif. *L. A. Hobbs*

Sola Electric Co.
4633 W. 16th St.
Chicago 50, Ill. *L. C. Marshall*

Solar Light Mfg. Co.
400 N. Ashland Ave.
Chicago 22, Ill. *Bernard Lazerson*

Solux Corp.
58-17 28th Ave.
Woodside 77, N. Y. *A. E. Spinetta*

Southern California Edison Co.
601 W. Fifth St.
Los Angeles 53, Calif. *Roy E. Dahlin*

Southern Canada Power Co. Ltd.
355 St. James St. W.
Montreal, Que. *M. A. Parry*

Southern Colorado Power Co.
Box 75, Pueblo, Colo. *E. H. Pemberton*

Southern Indiana Gas & Electric Co.
P. O. Box 569
Evansville, Ind. *C. K. Graham*

Southern Lighting Mfg. Co.
501 Elwell St.
Orlando, Fla. *Dan Pohler*

Southwestern Gas & Electric Co.
Box 1106, Shreveport, La. *E. F. Graham*

Southwestern Public Service Co.
P. O. Box 1261
Amarillo, Texas *Tom Lynn*

The Spero Electric Corp.
20500 St. Clair Ave.
Cleveland 17, Ohio *Manny Spero*

Standard Electric Co.
P. O. Box 96
Pontiac, Mich. *Abe Cohen*

The Starbuck Sprague Co.
39 Spring St.
Waterbury, Conn. *E. A. Madison*

Starring & Co. Inc.
1600 Seaview Ave.
Bridgeport, Conn. *Carl E. Paul, Jr.*

Steber Manufacturing Co.
2700 Roosevelt Rd.
Broadview, Ill. *Robert J. Besal*

Steel Craft Fluorescent & Stamping Co.
191 Murray St.
Newark 5, N. J. *Arthur Meister*

Sterling Electric Co.
33 South 5th St.
Minneapolis, Minn. *Fred Garling*

Sterling Reflector & Mfg. Co.
3249 West Grand Ave.
Chicago 51, Ill. *Anton Oberhuber*

Sticklor Electric Supply Co.
346 Ann St.
Hartford 3, Conn. *Marshall Sticklor*

Stonco Electric Products Co.
333 Monroe Ave.
Kenilworth, N. J. *H. W. Spence*

Suburban Electric Co.
157 Pleasant St.
Malden, Mass. *Warren K. Lewellen*

The Suburban Supply Co.
65 Watertown Ave.
Waterbury, Conn. *Charles Brenker*

Sunbeam Lighting Co.
777 E. 14th Place
Los Angeles 21, Calif. *Herbert L. Krieger*

Sun-Lite Manufacturing Co.
2555 Bellevue Ave.
Detroit 7, Mich. *Fred Binder*

Sun-Ray Fluorescent Co.
2025 So. Michigan Ave.
Chicago 16, Ill. *Jerome Gimbel*

The Superior Electric Co.
83 Laurel St.
Bristol, Conn. *William P. Carpenter*

Supreme Lighting Co.
600 Turner St.
Los Angeles 12, Calif. *Frank Blackwell*

Sylvania Electric Products Inc.
60 Boston St.
Salem, Mass. *W. P. Lowell, Jr.*

Sylvania Electric (Canada) Ltd.
Suite 522, University Tower Bldg.
Montreal, Que. *F. W. Fulle*

Tampa Electric Co.
Cass & Tampa Sts.
Tampa 1, Fla. *W. C. MacInnes*

Tarnow Electric Supply Co.
45 E. Milwaukee Ave.
Detroit, Mich. *Nathan Tarnow*

Frank C. Teal Co.
3222-24 E. Jefferson
Detroit 7, Mich. *Harold C. Smith*

Terreau-Racine Ltee.
196-228 St. Paul St.
Quebec, Que. *Georges Langlais*

Texas Electric Service Co.
Electric Bldg., Ft. Worth 1, Texas *O. G. Carlson*

Texas Power and Light Co.
P. O. Box 6331
Dallas 22, Texas *Bassett Watson*

Thompson Electric Co.
P. O. Box 875
Cleveland 22, Ohio *Robert K. Farrington*

(Continued on page 40A)

Another New Home for Lighting Installations by PERFECLITE

A view of the main floor portico illuminated with Perfeclite F-386 recessed ceiling units.

The John J. Kane Hospital
Scott Township
Allegheny County, Pennsylvania

Button & McLean, Pittsburgh, Pa., and Mitchell & Ritchey, Pittsburgh, Pa., Architects.
Edward T. Wiesmann, Pittsburgh, Pa., Electrical Engineer.
Lord Electric Co., Pittsburgh, Pa., Electrical Contractor.

Over 4,000 Perfeclite fixtures were used in the new 2,400-bed John J. Kane Hospital for the aged to light lobbies, corridors, wards, workrooms, entryways, and offices.

Wards are equipped with die cast aluminum HBL-4 bed lights (over 1,600 supplied on this project) utilizing Holophane #722 controlens.* 60 w. I.F. lamps give precise lighting at bed-level. SQ-142 die cast aluminum ceiling units with 4—60 w. I.F. lamps provide soft, evenly distributed general illumination.

Portico lighting is a good example of the installation of the versatile, close fitted F-386 made 4½" deep. Holophane #748 controlens* are used on these fixtures with 150 w. I.F. lamps.

There is a Perfeclite unit for every institutional interior. Write today for further information on our entire line. It meets the most rigid requirements.

A typical 24-bed ward equipped with Perfeclite HBL-4 wall mounted bed lights and SQ-142 ceiling units.

PERFECLITE PRODUCTS — THE MARK OF LIGHTING SERVICE

* Ⓡ Holophane Co., Inc.

THE PERFECLITE COMPANY
1457 EAST 40TH STREET • CLEVELAND 3, OHIO

Fixtures are Underwriters Laboratories, Inc. approved

(Continued from page 38A)

Toledo Edison Co.
Edison Bldg., Toledo 4, Ohio — *William R. Poole*

Toledo Electrical Contractors Association, Inc.
216 Secor Hotel
Toledo 4, Ohio — *Clarence F. Hammer*

Toronto Hydro-Electric System
14 Carlton St.
Toronto 2, Ont. — *Wilson J. Wylie*

B. M. Tower Co., Inc.
Dewey St., Bridgeport, Conn. — *Harvey N. Tower*

Tri-Part Mfg. Co.
934 Plum St., Detroit 1, Mich. — *Julius Reznik*

Union Electric Co.
515 N. 12th Blvd.
St. Louis 1, Mo. — *Merrill E. Skinner*

Union Metal Mfg. Co.
Canton 5, Ohio — *W. A. Porterfield*

Unistrut Corp.
4118 Monroe Ave.
Wayne, Mich. — *Hugo E. Rebentisch*

Unistrut Products Co.
1013 W. Washington Blvd.
Chicago 7, Ill. — *George W. Butler*

The United Illuminating Co.
80 Temple St.
New Haven 6, Conn. — *E. B. Haskell*

Universal Lighting Products, Inc.
55 Bergenline Ave.
Westwood, N. J. — *Elliott Kanarek*

Universal Mfg. Corp.
29-51 E. 6th St.
Paterson, N. J. — *Imrich Miller*

Utah Power & Light Co.
Box 899, Salt Lake City 10, Utah — *W. A. Huckins*

John C. Virden Co.
6009-6105 Longfellow Ave.
Cleveland 3, Ohio — *John C. Virden, Jr.*

John C. Virden Ltd.
19 Curity Ave.
Toronto, Ont. — *P. G. Kirkpatrick*

Virginia Electric & Power Co.
Richmond 9, Va. — *W. I. Dolbeare*

Voigt Company
1634-38 N. Carlisle St.
Philadelphia 21, Pa. — *C. J. Frank*

Voltarc Tubes, Inc.
44 Cross St., Norwalk, Conn. — *Miles Pennybacker*

Wadeford Electric Co.
205 W. Wacker Dr.
Chicago 6, Ill. — *H. H. Lundberg*

The Wakefield Co.
Vermilion, Ohio — *A. F. Wakefield*

Wald & Zigas
23-03 45th Rd.
Long Island City, N. Y. — *Henry J. Wald*

Warren Electric Co.
P. O. Box 2594
Houston, Texas — *J. R. Thompson*

Wasco Products Inc.
Bay State Rd.
Cambridge 38, Mass. — *M. C. Kirkpatrick*

The Washington Water Power Co.
P. O. Drawer 1445
Spokane 6, Wash. — *Gordon F. DeFoe*

Webb Electric Mfg. Co.
1701 S. W. Jefferson St.
Portland 1, Ore. — *F. E. Webb*

Welsbach Engineering and Management Corp.
1500 Walnut St.
Philadelphia 2, Pa. — *H. H. Adams*

Westinghouse Electric Corp., Lamp Division
Bloomfield, N. J. — *Marshall N. Waterman*

Westinghouse Electric Corp.
1216 W. 58th St.
Cleveland 2, Ohio — *E. C. Huerkamp*

Westinghouse Electric Supply Co.
3 Gateway Center, P. O. Box 448
Pittsburgh 30, Pa. — *Joseph W. Hartman*

West Penn Power Co.
Cabin Hill, Greensberg, Pa. — *R. G. MacDonald*

Wheeler Reflector Co.
Division of Franklin Research Corp.
275 Congress St.
Boston 10, Mass. — *Harlan B. Fletcher*

Wheeling Electric Co.
51 Sixteenth St.
Wheeling, W. Va. — *M. J. Barth*

Dick White Lighting, Inc.
170 Southdale
Edina 10, Minn. — *Donald D. Olson*

White Way Electric Sign & Maintenance Co.
1317 Clybourn Ave.
Chicago 10, Ill. — *Martin Davis*

Wholesale Electrical Supply Co.
7333 Cottage Grove Ave.
Chicago 19, Ill. — *Raymond D. Arenberg*

Wide-Lite Corp.
P. O. Box 191
Houston 1, Texas — *D. L. Calmes*

Wiedenbach-Brown Co. Inc.
111 Eighth Ave.
New York 11, N. Y. — *W. C. Stockberger*

Wigdahl Electric Co.
4246-48 Milwaukee Ave.
Chicago 41, Ill. — *T. J. Wigdahl*

R & W Wiley Inc.
119 Dearborn St.
Buffalo 7, N. Y. — *Robert C. Graves*

H. E. Williams Products Co.
108 S. Main St.
Carthage, Mo. — *F. B. Williams, Jr.*

Wilmot Castle Co.
P. O. Box 629
Rochester 2, N. Y. — *E. H. Greppin*

J. A. Wilson Lighting & Display Ltd.
280 Lakeshore Rd.
Toronto, Ont. — *J. A. Wilson*

The Windsor Utilities Commission
Hydro Division
149 Chatham St. W.
Windsor, Ont. — *Henry R. Soutar*

The Wiremold Co.
Hartford 10, Conn. — *Robert H. Murphy*

Wisconsin Electric Power Co.
Public Service Bldg.
Milwaukee 1, Wis. — *G. W. Van Derzee*

Wisconsin Power & Light Co.
122 W. Washington Ave.
Madison 1, Wis. — *M. R. Norton*

Wisconsin Public Service Corp.
Green Bay, Wis. — *A. G. Bur*

Worcester County Electric Co.
939 Southbridge St.
Worcester 3, Mass. — *Donald S. Bennett*

Work-O-Lite Co.
522 Cortlandt St.
Belleville, N. J. — *Jack Siegel*

Wright Light, Inc.
2924 Commerce St., P. O. Box 4155
Houston, Texas — *Merrill C. Wright*

Zenith Electric Supply Ltd.
185 Bridgeland Ave.
Toronto 10, Ont. — *B. R. Steen*

(Continued from page 28A)

NEMA. Mr. Ogden had served as temporary chairman of this new section since the organization meeting in April. **Paul Augenstein,** general manager of Room Air-Conditioning Dept., Appliance Division, General Electric Co., will be vice-chairman of the section.

Silvray Lighting Inc. and Associated Companies, Bound Brook, N. J., has announced the appointment of three new sales representatives in Florida. The new men are: **Joseph N. Crevasse** in Jacksonville, **George N. Jack** in Tampa and **James A. Foerster** in Miami. **William D. Faust,** New Orleans representative, will continue to service western Florida. **Sidney Chilton,** of Memphis, Tenn., has been appointed to the western Tennessee and northern Mississippi areas.

The Board of Directors of the American Institute of Electrical Engineers has elevated seven of its members to the grade of fellow. They are: **William B. Loper,** California Electric Power Co., Riverside, Calif.; **Edward R. Moore,** Detroit Edison Co., Detroit, Mich.; **Richard F. Stevens,** Bonneville Power Administration, Portland, Ore.; **Frederick T. Bear,** Pelaware Power & Light Co., Wilmington, Del.; **Milton Eaton,** consulting electrical engineer, Shawinigan Falls, Que.; **Francis X. Lamb,** Weston Instruments, Division of Daystrom, Inc., Newark, N. J., and **Robert O. Loomis,** Georgia Power Co., Atlanta, Ga.

Wendell E. Matchett has been named manager of the Chicago district for the Weston Instruments Division of Daystrom, Inc. Mr. Matchett, in his new assignment, will supervise all sales and district office operations for Weston in the Chicago area, including Illinois, northern Indiana and Iowa.

L. Canter & Son, Inc., Philadelphia, announces the appointment of **Herb Schwinger** as manager of the firm's wholesale lighting fixture department. Mr. Schwinger will be responsible for all activities of the department, with special emphasis on service to builders and decorators.

The election of two directors and four executives of Progress Manufacturing Co., Inc., has been announced. **Jerome H. Feig** and **W. J. Meinel** have become members of the Board of Directors of the company. **Herman Kesler** has been elected vice-president for marketing and merchandising; **Harold Yoskin** has been elevated to vice-president; **Oskar Riesmann** has been elected assistant secretary of the corporation and **Arthur L. Foster** has been appointed director of advertising.

Deaths

Milton L. Levy, New Orleans Section.
Edmund D. Schorr, Chicago Section.
J. R. Thomas, Ohio Valley Section.

(Lighting News continued on page 42A)

new....LPI...VERSATAIRE

BRINGS YOU

152 different type units

IN ONE FLUORESCENT SERIES

Architects, engineers, and designers can command more than 152 different type units in this new LPI Versataire Series. Versataire offers unlimited possibilities to satisfy most all design and engineering demands and illumination benefits. Whenever you specify or consider fluorescent lighting be sure to consider the versatility of Versataire.

- **direct or direct-Indirect**
- **for 2 and 4 lamps**
- **in 4 and 8 foot lengths**
- **with solid and luminous sides**
- **with 6 different diffusers**
- **12" - 18" - 24" wide**
- **for close-ceiling or pendant mounting**

6 different diffusers

Ventralens

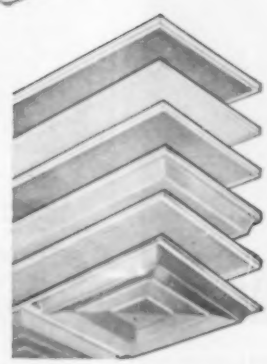
Polystyrene

#70 Corning Glass

Formed Acrylic

#93 Alba Lite Glass

Pattern Vinyl



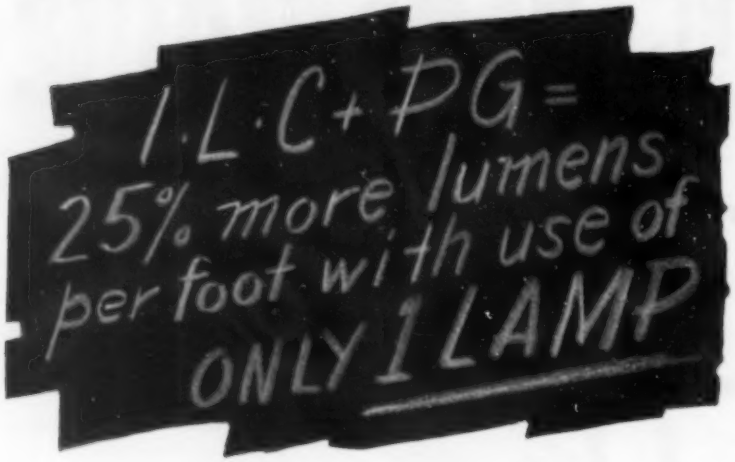
most lighting per dollar

lighting products, inc.
Highland Park, Illinois

LPI

LIGHTING PRODUCTS INC.,
Dept. 6-G, Highland Park, Ill.
Gentlemen: Please send Free Literature
Name_____
Firm_____
Address_____
City_____ State_____
Versataire.

A New Lighting Formula!



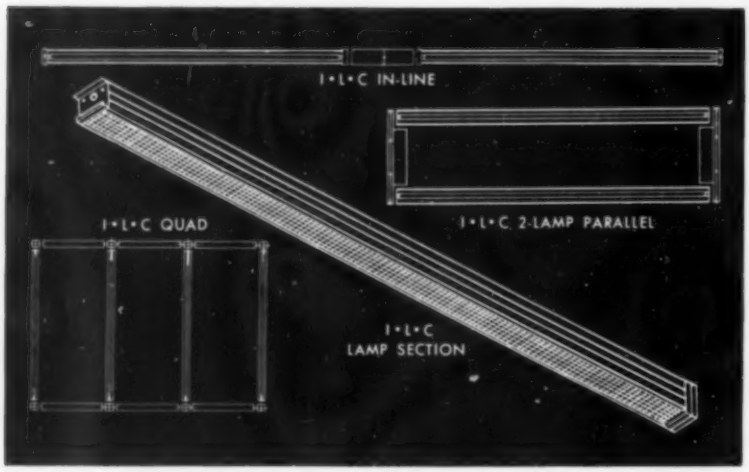
INDIRECT LUMINOUS CEILINGS

I·L·C

I·L·C—the first lighting fixture designed to use Power Groove fluorescent lamps with complete visual comfort for commercial lighting at 100 to 250 ft. candles.

Therefore, I·L·C with only one P. G. lamp actually provides 25% more lumens per foot than other units with two lamps when used in large selling and display areas. It all adds up to—more and better quality light at less cost with I·L·C.

3 BASIC I·L·C ARRANGEMENTS



I·L·C IN-LINE: Continuous single row tandem arrangements of two or more lamps with associated ballast enclosures and hangers.

I·L·C 2-LAMP PARALLEL: Two lamps in parallel arrangement on 24" centers, for individual or continuous row installations.

I·L·C QUAD: A multiple lamp system with provision for four or more 72" or 96" lamps in parallel and in-line arrangements, or both, and with spacing between lamps of 4', 6' or 8' as required.

For complete details send for Bulletin 5257

581 A

SILVRAY LIGHTING, INC.
BOUND BROOK, NEW JERSEY

(*Lighting News continued from page 40A*)

BOOKS AND PAMPHLETS

Notes on a Dynamic Theory of Vision, Third Revision, 1958, by Darell Boyd Harmon, Austin, Texas. Published by the author. Price, $5.00.

This book is divided into three sections: Movement, Posture and Vision; Vision: Is It Perceptual Only?; The Role of Posture and Movement in Vision. It is a study and discussion outline and is intended for conference or seminar use.

American Standards C78.380-1957 for the Designation of Mercury Lamps (50 cents), and **C78.390** for the Designation of Miniature Lamps (35 cents). Also **C82.3** for Fluorescent Lamp Reference Ballasts (35 cents). Available from the American Standards Association, 70 East 45th St., New York 17, N. Y.

Sherlock Ohms and Dr. Watts Illuminate the Case of the Unknown Quantity, available from Better Light Better Sight Bureau, 750 Third Ave., New York 17, N. Y.

This new comic book designed for use in stimulating consumer interest in good home lighting is priced for mass distribution by utilities and available for immediate shipment.

How To Judge a Light Bulb, available from Lamp Division, Westinghouse Electric Corp., Bloomfield, N. J.

Facts about lamp life, light output and cost of light are featured in this 8-page, 2-color booklet. Also included are sections on the technical aspects of lamps, written in simple terms, and a discussion of the economics of light.

Electrical Information Especially for the Girls, available from the Power Use Department, 11-L-22, Westinghouse Electric Corp., East Pittsburgh, Pa., $5.00 for 50 copies (minimum order); for quantity orders, $9.25 per 100 copies.

This 32-page, 6 x 9-inch booklet dealing with residential lighting and the use, care and characteristics of household electrical appliances was designed originally for 4-H club girls but should prove helpful to every woman.

Seeing, A Guide to the Best Use and Care of the Eyes, published by The Western Institute of Light and Vision, 1034 Lexington Ave., Pasadena 6, Calif., price F.O.B., Los Angeles, $2.50 per 100 copies,

lower rates for orders of 5000 or more.

The revised 1958 edition of this 32-page booklet is now in print. Booklets can be ordered with company name imprinted, or banded together in packets of 25 with a message imprinted on the band. Imprinting and banding are at nominal charges. A sample copy is available on request to the publisher.

NEMA Standards, available from the National Electrical Manufacturers Association, 155 East 44th St., New York 17, N. Y., at prices per copy as indicated.

AEIC-EEI-NEMA Standards for Watthour Meters, EI 20-1958, 50 cents.

American Standard for Outlet Receptacles, Attachment Plug Caps and Appliance Plugs, WD 1-1956, $1.50.

EEI-NEMA Standards for Multiple Sockets and Supports, SH 17-1958, 25 cents.

NEMA Standards Publication for Manufactured Graphite Electrodes, CG 1-1958, 20 cents.

NEMA Standards Publication for Automatic Circuit Reclosers and Automatic Line Sectionalizers, SG 13-1958, $2.25.

NEMA Standards Publication for Signalling Apparatus, SB 1-1957, mimeographed, 40 cents.

I Want To Know About the Electric Industry, published by Edison Electric Institute, 750 Third Ave., New York 17, N .Y.

The 1958 edition of this annual publication gives the latest available figures, in text and tabular form, on the electrical industry. New features included in this edition are questions about the taxes the industry pays, use of color inside the booklet, and a page of six charts covering generating capacity, electricity production, construction expenditures, kwh sales, residential use and cost, and customers. The booklet is in the form of answers to 29 questions most frequently asked about the industry.

NEW MEMBERS

At the meeting of the I.E.S. Council on June 5, the following were elected to membership. Names marked * are transfers from Associate Member Grade. Names marked ** are transfers from Student Member Grade.

ALABAMA SECTION

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Cocke, J. M., James A. Evans, Consulting Engineer, Birmingham, Ala.

(*Continued on page* 44A)

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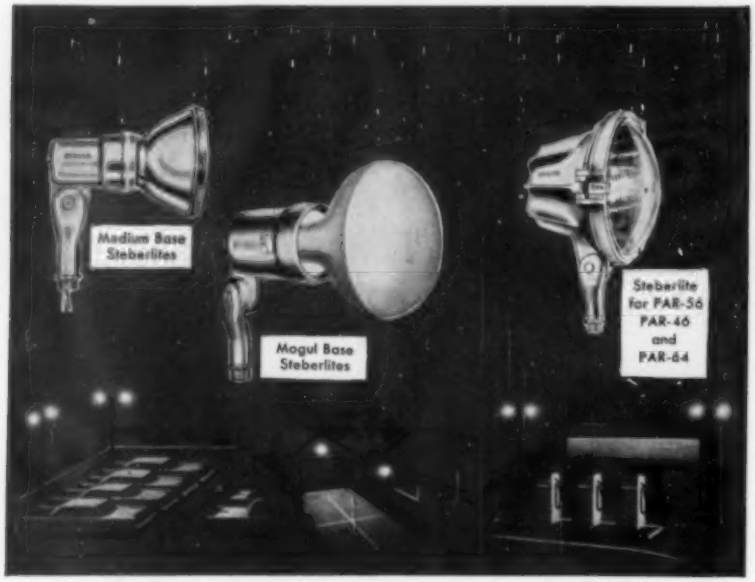

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(Continued from page 43A)

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Wera, L. J., Jr., Sola Electric Co., Chicago, Ill.

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Palmer, A. A., Wheeler Fullerton Division of Franklin Research Corp., Boston, Mass.

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Green, R. E., Crouse-Hinds Co., Omaha, Nebr.

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Wood, D. E., Crescent Electric Supply Co., Sioux City, Iowa.

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Moyer, R. H., General Electric Supply Co., Allentown, Pa.

Schmidt, F. J., Schmidt Electric Co., Steelton, Pa.

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Schelander, O. E., State of California, Division of Highways, Fresno, Calif.

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Gilmartin, R. T., Jr., Western Asbestos Co., Oakland, Calif.

Heisdorf, F. M., Westinghouse Electric Supply Co., Fresno, Calif.
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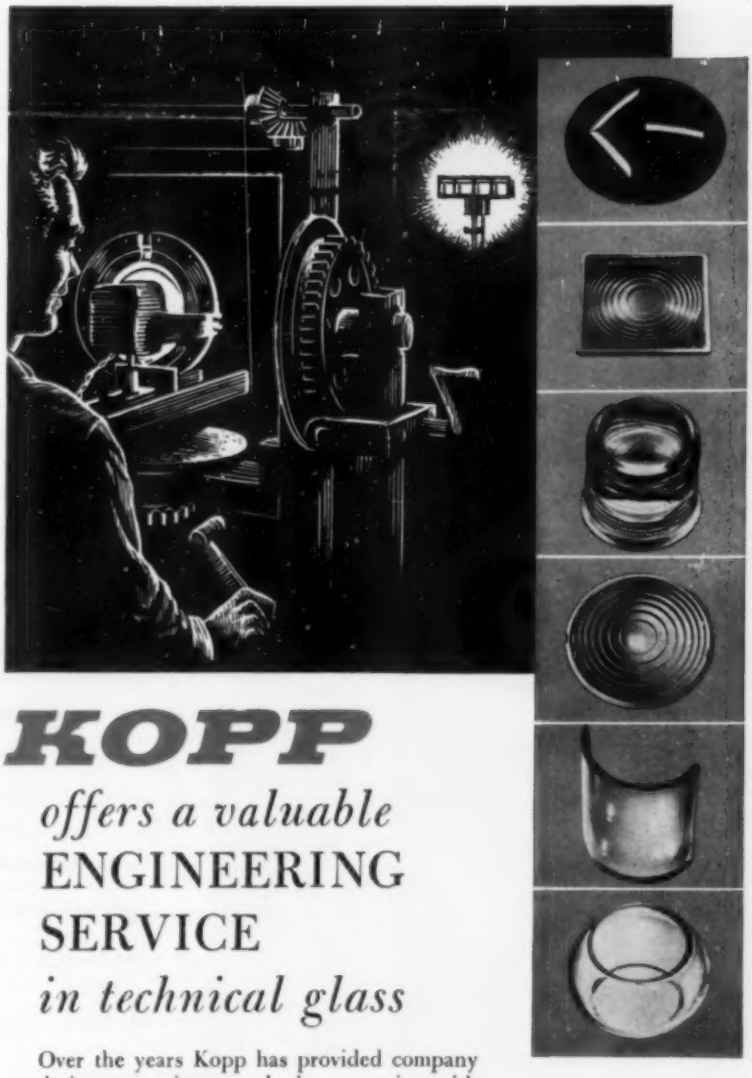
Dohren, Martin, Rotuba Extruders, Inc., Brooklyn, N. Y.
Friedwald, David, Rotuba Extruders, Inc.,

(*Continued on page 46A*)



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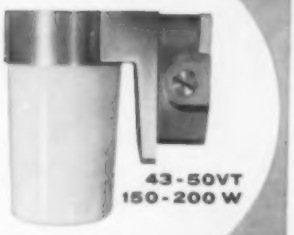

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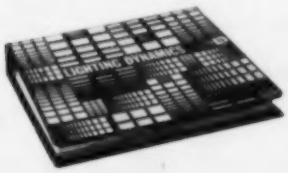

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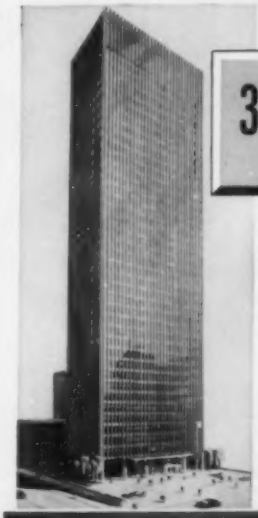

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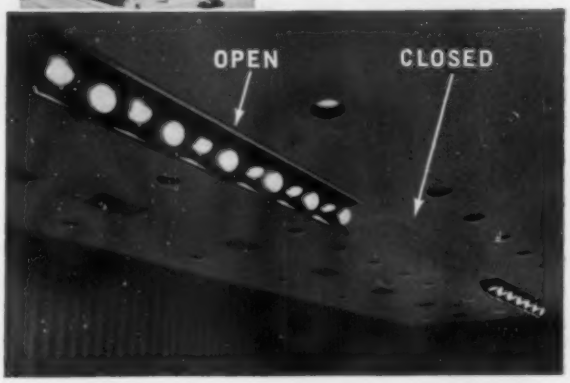

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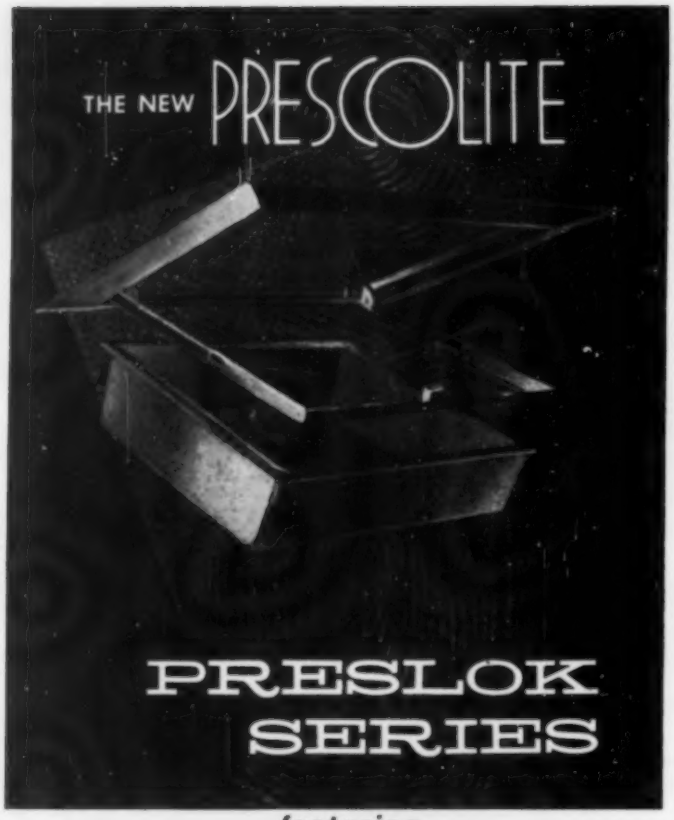

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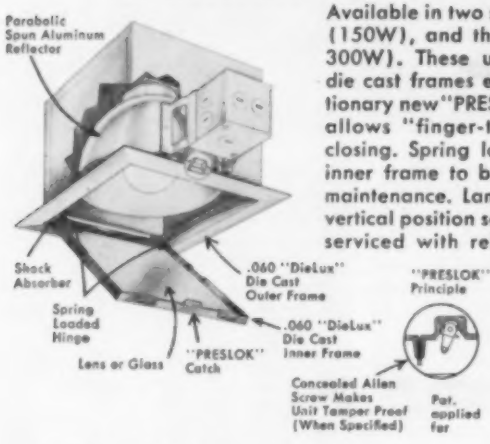
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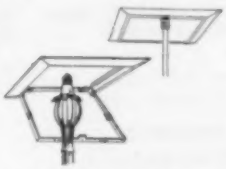

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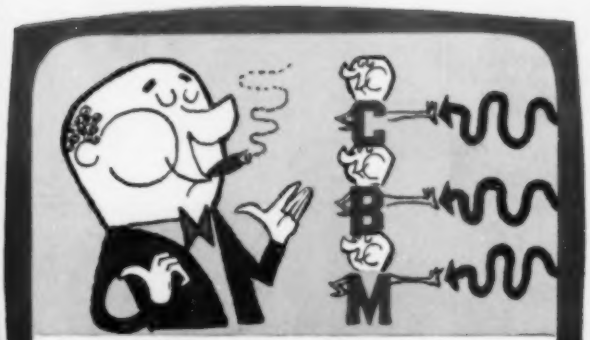

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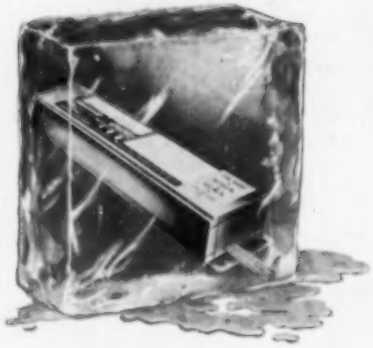

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